Site Characterization Completion Report/ Remedial Action Plan

Prepared for
HVF West, LLC
VRP Site Code 513374-00
6581 East Drexel Road
Tucson, Arizona 85756
June 26, 2020

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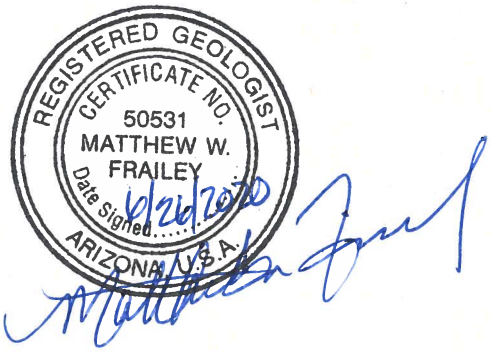

Project No. 154686

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List of Abbreviations

ADEQ	Arizona Department of Environmental Quality
A.R.S.	Arizona Revised Statutes
BC	Brown and Caldwell
bgs	below ground surface
COC	contaminant of concern
CRP	Community Relations Plan
DEUR	Declaration of Environmental Use Restriction
DUS	data usability summary
Gallaher	Gallaher Revocable Trust
GPL	Groundwater Protection Levels
HASP	Health and Safety Plan
HVF	HVF West, LLC
Legend	Legend Technical Services Inc.
mg/kg	milligrams per kilogram
MS/MSD	matrix spike/matrix spike duplicate
nrSRL	non-residential soil remediation level
QAPP	Quality Assurance Project Plan
QC	quality control
Report	Site Characterization Completion Report
RPD	relative percent difference
rSRL	residential soil remediation level
Site	6581 East Drexel Road, Tucson, Arizona
SPLP	Synthetic Precipitation Leaching Procedure
SRL	soil remediation level
TCLP	Toxicity Characteristic Leaching Procedure
USEPA	United States Environmental Protection Agency
VRP	Voluntary Remediation Program
Work Plan	Site Investigation Work Plan

Section 1

Introduction

1.1 Purpose

This Site Characterization Completion Report (Report) has been developed by Brown and Caldwell (BC) on behalf of HVF West, LLC (HVF), the owner and operator of a materials recovery facility located at 6581 East Drexel Road in Tucson, Arizona (Site). The investigation described in this Report was conducted under the authority of the Arizona Department of Environmental Quality's (ADEQ's) Voluntary Remediation Program (VRP) in pursuit of a No Further Action determination by the State of Arizona.

Investigative efforts were performed in accordance with a Site Investigation Work Plan (Work Plan) authored by BC dated April 24, 2020. The Work Plan was submitted, and approved by, the ADEQ VRP and has been assigned the ADEQ VRP Site Code of 513374-00.

The data presented herein are a combination of data gathered during January 2020 by the ADEQ and HVF and the additional data collected in accordance with the Work Plan. The data collected assessed the Site soils for the presence of cadmium, chromium, lead, and mercury. Details presented in this Report include the Site background, completed soil investigative activities, and planned soil remediation.

1.2 Site Location and Description

The HVF property consists of several neighboring parcels located in an industrial area south of Davis-Monthan Air Force Base, Tucson, Pima County, Arizona. Parcel 141-03-007B is approximately 7.5 acres in area and consists of the main processing area of the facility. The investigation area, located north of the shredder mill within parcel 141-03-007B, was the focus of the Work Plan and is hereafter referred to as the Site. Figure 1 presents a Vicinity Map, and Figure 2 presents a Site Map depicting the investigation area.

1.3 Site History

The HVF property was formerly owned by Gallaher Revocable Trust (Gallaher) and began operations as an aircraft salvage and recycling facility in 1964. HVF purchased Parcel 141-03-007B from Gallaher in December 1995. HVF specializes in demilitarization of military material to United States Department of Defense specifications. Scrap material from industrial and government contracts is shredded and sold to smelters and steel mills.

1.4 Project Background

The ADEQ conducted a hazardous waste field inspection on January 15, 2020. During the inspection, the ADEQ collected samples from two locations at the site, with the ADEQ delivering splits of the samples to HVF. The first sample was collected from a powdered layer of material on concrete at the base of a pile of metal scrap. The second sample was collected from the top 3 inches of soil in an area adjacent to the concrete slab. The ADEQ submitted the samples to Eurofins TestAmerica, a third party registered environmental laboratory, for analysis of total chromium and cadmium by Toxicity Characteristic Leaching Procedure (TCLP). HVF submitted the split samples to Legend Technical

Services, Inc. (Legend), also an Arizona-registered environmental laboratory. In addition to total chromium and TCLP cadmium, Legend was instructed to analyze the samples for total cadmium and hexavalent chromium. Table 1-1 summarizes the analytical results.

Table 1-1. ADEQ and HVF January 2020 Sample Results

Sample ID	Sample Date	Parameter				
		Cadmium	Chromium, total	Chromium VI	Chromium III	Cadmium, TCLP
ADEQ-HVFC-1	1/15/2020	–	1,100	–	–	4.2
HVF-HVFC-1	1/15/2020	47	110	9.33	101	3.9
ADEQ-HVFS-1	1/15/2020	–	480	–	–	4.9
HVF-HVFS-1	1/15/2020	110	230	7.60	222	3.9
Residential SRL		39	NE	30	120,000	NE
Non-Residential SRL		510	NE	65	1,000,000	NE

SRL = Soil Remediation Level (Arizona)

NE = No SRL established for this parameter

As shown in the table above, cadmium, trivalent chromium, and hexavalent chromium concentrations reported below non-residential soil remediation levels (nrSRLs) in all samples. Hexavalent and trivalent chromium concentrations also reported below residential soil remediation levels (rSRLs).

Section 2

Site Investigation

This section of the Report describes the specific activities and methodologies that were implemented to evaluate the soil conditions at the Site.

2.1 Sampling and Analysis

A Site-specific Health and Safety Plan (HASP) addressing the planned soil sampling activities was produced prior to commencing the field activities. As specified in the HASP, field activities were performed in Level D personal protective equipment as defined by Occupational Safety and Health Administration requirements detailed in Code of Federal Regulations 20 § 1910.120. Public utility locating was coordinated through Arizona Blue Stake. A private underground utility locater did not identify any utilities within the investigation area.

2.1.1 Contaminants of Concern

Based on facility operations, HVF has identified cadmium, chromium, lead, and mercury as the contaminants of concern (COC) for the Site.

2.1.2 Sampling

On May 26, 2020, a BC staff geologist and the project manager conducted soil investigation efforts. Resilient Drilling Services, LLC, an Arizona-licensed drilling subcontractor, was selected to perform drilling and sampling of the borings. A track-mounted drill rig equipped with direct-push drilling methods was used for sample collection. Following completion of each boring, the borehole was backfilled with soil cuttings augmented by bentonite grout chips (hydrated), as necessary.

A grid pattern was developed to encompass the shredder mill area and previous ADEQ sample locations. The sampling grid included a total of 12 original sampling locations named S-1 through S-12. The sampling grid was planned to be approximately 80 feet long (north to south) and 60 feet wide (east to west) with sample locations spaced on a 20-foot grid. However, sample locations S-11 and S-12 were relocated, which increased the sampling grid to approximately 100 feet long (north to south). Boring locations S-4, S-7, S-10, and S-11 were located in areas covered in concrete. Therefore, the concrete was cut, and the samples were collected from the soil beneath. Boring location S-2 was not able to be collected as planned. Refusal was encountered two times, and no recovery occurred on the third attempt.

On June 16, 2020, a BC staff geologist conducted additional soil investigation efforts. Sampling was completed with a hand auger around the S-3 boring location. Two additional samples were collected west and east of S-3, designated as S-13 and S-14, respectively, in order to further delineate this area. As a precaution, BC stepped out farther to the west and east and collected samples at S-15 and S-16, respectively. The samples from S-15 and S-16 were held and not analyzed.

The configuration of the sample grid is presented on the Sample Location Map (Figure 3).

2.1.3 Sampling Approach

At the sampling locations for S-1 and S-4 through S-11, soil samples were collected from 0 to 6 inches, 6 to 12 inches, 12 to 24 inches, 24 to 36 inches, and 36 to 48 inches below the ground

surface (bgs). As discussed above, boring location S-2 was not sampled due to refusal and no recovery. Boring locations S-3 and S-12 were not able to be sampled below 12 inches due to refusal.

For each sample interval, the soil was placed into a new clean plastic bag. The sample was then broken up and homogenized inside the closed bag by hand while wearing nitrile gloves. If duplicate samples were collected for quality control, then sample volume was divided in half. Using gloved hands or the trowel, the sample was transferred into a laboratory-supplied sterile, 8-ounce, wide-mouth glass jar. For duplicate samples, the process was repeated using a separate jar. Immediately following sample collection, each glass jar was capped with a screw-on Teflon-lined cap, wiped clean of dirt and moisture, and labeled with a unique sample identification number.

2.1.4 Laboratory Analyses

The soil samples were submitted to Pace Analytical, an Arizona Department of Health Services licensed laboratory. The samples, including field duplicates, were submitted for analysis of total cadmium, chromium, and lead via United States Environmental Protection Agency (USEPA) Method 6010C; hexavalent chromium via USEPA Methods 3060A/7196A; and total mercury via USEPA Method 7471. The samples collected from 0 to 6 inches were analyzed first, while the remaining samples were held pending the analytical results.

Based on the results from samples collected from the 0 to 6-inch sample interval, one additional sample from the 6 to 12-inch sample interval was analyzed for total lead via USEPA Method 6010C.

Based on the total metals results, soil samples S-8-(0-6) and S-12-(0-6) were also subjected to the Synthetic Precipitation Leaching Procedure (SPLP) extraction to support determination of Alternative Groundwater Protection Levels (GPLs) in accordance with ADEQ guidance.

The analytical data packages collected during the site characterization investigation are included in Appendix A.

2.1.5 Quality Assurance/Quality Control

The Quality Assurance Project Plan (QAPP) was developed to ensure that the evaluation and remediation activities generated complete and accurate data sets with little bias and high precision that are usable for the decision-making required to satisfy the project objectives. Implementing the procedures in this QAPP resulted in data collected in the field and in the analytical laboratory that were precise, accurate, representative, complete, and comparable to actual Site conditions.

Field quality control (QC) and laboratory QC samples were collected and analyzed as part of Site investigation activities. These samples included blind field duplicate, equipment rinsate blanks, and temperature blank samples. Internal laboratory QC samples were processed and included method blanks, matrix spike/matrix spike duplicate (MS/MSD) samples, and laboratory control/laboratory control duplicate samples. One site-specific MS/MSD was collected from sample location S-1 in the upper depth interval.

Field duplicate samples were used to check for sampling and analytical error, reproducibility, and homogeneity. Duplicate samples were collected on an approximate 10-percent basis and analyzed under the same parameters specified for investigative samples. Temperature blanks were supplied by the laboratory and used to record the cooler temperature upon receipt at the laboratory. Laboratory QC samples were processed by the laboratory and used to verify the laboratory process and instrument calibration. No trip blanks were processed since volatile organic analyses were not part of investigation activities.

2.1.6 Analytical Data Verification

Data verification was performed as part of investigation activities to ensure that complete, accurate, and consistent information was generated to characterize the physical conditions of the Site and to support the usability of data to satisfy the project objectives. For the purposes of this Site investigation, data verification and validation were conducted by a senior BC staff member not directly involved with day-to-day activities of the Site investigation. Data usability analysis was performed in accordance with the QAPP included in the Work Plan.

As part of this effort, a Data Usability Summary (DUS) Report was produced for the analytical reports with data contained herein. Appendix B contains the DUS Report.

The DUS Report identified the laboratory analytical report being evaluated and listed the number of samples collected, including field duplicates and laboratory control samples. Along with the laboratory report and sample identification, the components of each laboratory report were reviewed to confirm the data met QC and QAPP requirements. Based on these reviews, the following is a summary of the DUS findings:

- Lab Reports #L1222632, L1225459, L1227071, and L1229769
  - Overall quality of the analytical data was found to be within QC limits established by analytical methods and project review criteria presented in USEPA guidance documents.
  - Field duplicate sample S-11-(0-6) precision between the parent sample and the field duplicate was within the control limits specified in the QAPP. A laboratory replicate was analyzed, and precision was within control limits.
  - The sample results for hexavalent chromium in the equipment blank were analyzed outside of the 24-hour hold time and were therefore qualified as estimated. The remaining holding times met acceptance criteria.
  - The laboratory and field blanks reported no detections of the COCs and therefore were within control limits.
  - The MS/MSD recoveries and relative percent differences were outside control limits for mercury, cadmium, chromium, and lead in sample S-1-(0-6). Parent sample detections were qualified as estimated, “J,” due to likely high bias and poor precision.

2.2 Investigative Derived Waste

Waste material generated as a direct result of investigative efforts was limited to soil cuttings and decontamination rinse water. All soil cuttings remained on-site at the point of investigation, and decontamination water was discharged to the ground surface and allowed to evaporate at sample collection points and/or equipment staging areas.

Other waste products generated were limited to disposable materials (plastic bags, paper towels, etc.) and used personal protective equipment. These materials were disposed of as non-regulated solid waste in a facility solid waste dumpster.

Section 3

Analytical Results

Data presented herein is inclusive of the May and June 2020 soil investigations completed at the Site. Sample analyses included total cadmium, chromium, and lead via USEPA Method 6010C; hexavalent chromium via USEPA Methods 3060A/7196A; and total mercury via USEPA Method 7471. The analytical samples results are summarized in Tables 3-1 and 3-2 below.

3.1 Site Investigation Data

The first objective of the investigation was to characterize soil beneath the concrete in the vicinity of where the ADEQ collected a sample of material above the concrete (HVFC-1) on January 15, 2020. Soil boring S-11 was completed in proximity to the HVFC-1 sample location. Total cadmium, lead, and mercury were all below rSRLs in the soil sample (and duplicate) collected from S-11 at a depth of 0 to 6 inches below the concrete sub-base. Likewise, soil sample results collected from 0 to 6 inches at borings S-4, S-7, and S-10 were also below rSRLs. Based on these results, no samples from deeper intervals were analyzed from these locations.

Regarding chromium, results were reported for total chromium while neither an rSRL nor nrSRL exists for total chromium; rather, there are rSRLs and nrSRLs for trivalent chromium and hexavalent chromium. Hexavalent chromium SRLs are significantly lower than trivalent chromium SRLs. The highest total chromium value recorded in the data set (63.5 milligrams per kilogram [mg/kg]) did not exceed the rSRL for hexavalent chromium, so chromium would be of no concern regardless of speciation. Regardless, each soil sample was also analyzed for hexavalent chromium confirming no results above rSRLs. Each boring location is depicted on Figure 3.

Table 3-1. Summary of Selected Metals in Soil Samples in Soil below Concrete

Sample ID	Date	Sample Depth (inches)	Metal Compounds by Method 6010C/7471 (mg/kg)				Hexavalent Chromium by Method 3060A/7196A (mg/kg)	Trivalent Chromium (calculated)] (mg/kg)
			Cadmium (Total)	Chromium (Total)	Lead (Total)	Mercury (Total)		
Residential, Soil Remediation Level			**39**	–	**400**	**23**	**30**	**120,000**
Non-Residential, Soil Remediation Level			**510**	–	**800**	**310**	**65**	**1,000,000**
S-4 (0–6)	5/26/2020	0–6	0.554	14.5	11.0	<0.018	<0.640	14.5
S-7 (0–6)	5/26/2020	0–6	11.4	35.7	36.2	0.0940	<0.640	35.7
S-10 (0–6)	5/26/2020	0–6	35.5	63.5	88.0	0.220	5.48	58
S-11 (0–6)	5/26/2020	0–6	0.573	19.3	12.8	<0.0180	<0.640	19
S-11 (0–6) DUP	5/26/2020	0–6	0.523	20.3	13.6	0.0297 J	<0.640	20

The remaining borings depicted on Figure 3 were completed to characterize soil in the vicinity of soil sample HVFS-1, which was collected by the ADEQ on January 15, 2020. A grid pattern of borings encompassing the reported location of HVFS-1 was completed as shown on Figure 3. None of the soil samples collected exhibited chromium or mercury above rSRLs or nrSRLs. Cadmium was detected above rSRLs in some locations; however, all of the cadmium results were below nrSRLs.

Lead was also detected above rSRLs in certain locations but was only above the nrSRL in one soil sample collected at the 0 to 6-inch interval at boring location S-3.

Since the extent of the lead nrSRL exceedance at S-3 was not fully delineated laterally to the east and west, additional investigation was completed. Additionally, the 6 to 12-inch interval from S-3 was analyzed for lead, and the results were below the nrSRL. On June 16, 2020, two additional samples (S-13 and S-14) were collected from 0 to 6 inches in locations west and east of boring S-3. The samples from S-13 and S-14 were analyzed for lead, and the concentrations reported below the nrSRL. The soil sample results are summarized below in Table 3-2.

Table 3-2. Summary of Selected Metals in Soil Samples

Sample ID	Date	Sample Depth (inches)	Metal Compounds by Method 6010C/7471 (mg/kg)				Hexavalent Chromium by Method 3060A/7196A (mg/kg)	Trivalent Chromium (calculated)] (mg/kg)
			Cadmium (Total)	Chromium (Total)	Lead (Total)	Mercury (Total)		
Residential, Soil Remediation Level			**39**	–	**400**	**23**	**30**	**120,000**
Non-Residential, Soil Remediation Level			**510**	–	**800**	**310**	**65**	**1,000,000**
S-1 (0–6)	5/26/2020	0–6	**124**	198	**409**	0.383	1.5 J	197
S-3 (0–6)	5/26/2020	0–6	**298**	349	**5,220**	1.51	1.08 J	348
S-3 (6–12)	5/26/2020	6–12	–	–	**668**	–	–	–
S-5 (0–6)	5/26/2020	0–6	3.72	18.4	21.4	0.033 J	0.667 J	18
S-6 (0–6)	5/26/2020	0–6	**107**	282	320	1.21	11.3	271
S-8 (0–6)	5/26/2020	0–6	32.9	1,130	106	0.202	<0.640	1,130
S-9 (0–6)	5/26/2020	0–6	14.7	34.8	67.8	0.0586	0.833 J	34
S-12 (0–6)	5/26/2020	0–6	**237**	370	**752**	1.29	9.92	360
S-13 (0–6)	6/16/2020	0–6	–	–	**597**	–	–	–
S-14 (0–6)	6/16/2020	0–6	–	–	**535**	–	–	–

As outlined above, HVF has delineated the extent of all lead impacted soil.

3.2 Groundwater Protection Level Analyses

BC evaluated the data set utilizing methods outlined in ADEQ's guidance document entitled "A Screening Method to Determine Soil Concentrations Protective of Environmental Quality" (September 1996). Six cadmium, one chromium, and seven lead detections exceeded the minimum GPL based on a default leaching ratio of 20:1. The actual leaching ratio varies from site to site and is usually much greater than 20:1 since a significant amount of the metals in soil is usually not leachable. In order to calculate site-specific alternative GPLs for cadmium, chromium, and lead, BC instructed Pace Analytical to subject soil samples S-8 (0–6 inches) and S-12 (0–6 inches) to the SPLP. SPLP leachate from the S-8 sample extraction was analyzed for chromium, while the S-12 sample was analyzed for cadmium and lead. The SPLP results are summarized in Table 3-3.

Table 3-3. SPLP Results					
Sample ID	Date	Sample Depth (inches)	SPLP Metals (Methods 1311/6010D) (mg/l)		
			Cadmium	Chromium	Lead
S-8 (0–6)	5/26/2020	0–6	–	0.0226	–
S-12 (0–6)	5/26/2020	0–6	0.00195	–	<0.00295

The above SPLP concentrations were used to calculate site-specific GPLs for cadmium, chromium, and lead of 177,993 mg/kg, 1,464,500 mg/kg, and 3,733,230 mg/kg, respectively.

As shown in Table 3-4 below, none of the soil samples exhibit metals concentrations above the calculated site-specific GPL. None of the mercury detections exceeded the default minimum GPL; therefore, a site-specific alternative GPL for mercury was not calculated.

Table 3-4. Comparison of Results to Groundwater Protection Levels (GPLs)						
Sample ID	Date	Sample Depth (inches)	Metal Compounds by Method 6010C/7471 (mg/kg)			
			Cadmium (Total)	Chromium (Total)	Lead (Total)	Mercury (Total)
Minimum Groundwater Protection Level, Soil			**29**	**590**	**290**	**12**
Site-Specific Groundwater Protection Level, Soil			**177,993**	**1,464,500**	**3,733,230**	–
S-1 (0–6)	5/26/2020	0–6	**124**	198	**409**	0.383
S-3 (0–6)	5/26/2020	0–6	**298**	349	**5,220**	1.51
S-3 (6–12)	5/26/2020	6–12	–	–	**668**	–
S-4 (0–6)	5/26/2020	0–6	0.554	14.5	11.0	<0.018
S-5 (0–6)	5/26/2020	0–6	3.72	18.4	21.4	0.033 J
S-6 (0–6)	5/26/2020	0–6	**107**	282	**320**	1.21
S-7 (0–6)	5/26/2020	0–6	11.4	35.7	36.2	0.0940
S-8 (0–6)	5/26/2020	0–6	**32.9**	**1,130**	106	0.202
S-9 (0–6)	5/26/2020	0–6	14.7	34.8	67.8	0.0586
S-10 (0–6)	5/26/2020	0–6	**35.5**	63.5	88.0	0.220
S-11 (0–6)	5/26/2020	0–6	0.573	19.3	12.8	<0.0180
S-11 (0–6) DUP	5/26/2020	0–6	0.523	20.3	13.6	0.0297 J
S-12 (0–6)	5/26/2020	0–6	**237**	370	**752**	1.29
S-13 (0–6)	6/16/2020	0–6	–	–	**597**	–
S-14 (0–6)	6/16/2020	0–6	–	–	**535**	–

3.3 Data Summary

Based on the above results, cadmium, chromium, and mercury concentrations are below nrSRLs. Cadmium, chromium, and lead are below alternative, site-specific GPLs, while mercury is below the default GPL. Lead is the only COC present above nrSRLs, and the extent of lead-impacted soil above nrSRLs has been fully characterized.

Section 4

Remedial Action Plan

HVF will seek a Conditional No Further Action determination for cadmium, chromium, lead, and mercury pursuant to Arizona Revised Statutes (A.R.S.) §49-181(D). Lead is the only constituent that will require remediation to in order to achieve nrSRLs.

4.1 Soil Excavation

Based on the soil boring results collected in May and June 2020, the remedial action that HVF will implement is soil excavation in the area of the S-3 boring location. At a minimum, the top 6 inches from boring S-13 (east) to S-14 (west) and S-1/S-12 (north) to S-5/S-6 (south) will be excavated. This is approximately a 20-foot by 40-foot by 6-inch deep area. The configuration of the soil excavation is presented on the Remedial Action Plan Map (Figure 4). The excavated soil will be staged on plastic in a secure area on-site and covered with plastic to prevent contact with precipitation until arrangements for transportation and disposal are finalized.

4.2 Confirmation Sampling and Analysis Plan

This confirmation sampling and analysis plan summarized proposed activities for monitoring during remediation to verify that approved remediation levels have been attained.

4.2.1 Post-Excavation Sampling Locations

Post-excavation samples will be collected at approximately 20-foot intervals along each excavation sidewall. Thus, two samples will be collected from each of the east and west excavation sidewalls, and one sample will be collected in the approximate middle of each of the north and south excavation sidewalls. Two additional samples will be collected from the excavation bottom. Proposed sample locations are presented on the Remedial Action Plan Map (Figure 4). If sample results show that one or more of the samples exceed total lead nrSRLs, then additional excavation will be performed and a “stepout” or deeper confirmation sample will be collected. This process will continue until sample results confirm removal of all lead impacted soil above nrSRLs.

4.2.2 Confirmation Sampling Procedure

Soil sampling will be completed using a gloved hand and/or trowel. At each of the confirmation sampling locations, soil samples will be collected from 0 to 6 inches bgs from the excavation walls to confirm that all impacted soil has been removed. Soil samples will also be collected from 0 to 6 inches from the excavation bottom.

For each sample interval, the soil will first be placed into a clean plastic bowl or new Ziploc® bag. The sample will then be broken up and homogenized with a plastic trowel or by hand while wearing nitrile gloves. If duplicate samples will be collected for quality control, the sample volume will be divided in half. Using gloved hands or the trowel, the sample will be transferred into a laboratory-supplied sterile, 8-ounce, wide-mouth glass jar. For duplicate samples, the process will be repeated using a separate jar. Immediately following sample collection, each glass jar will be capped with a screw-on Teflon-lined cap, wiped clean of dirt and moisture, and labeled with a unique sample identification number.

Each label will include the following information:

- Project name
- Sample identification
- Date and time of sample collection
- Sampler's initials
- Requested analyses

To allow tracking of the individual samples, each will be assigned a unique sample identification number at the time of collection. The sample identification number will include the following information:

- Sample type description (e.g., soil sample = SS)
- Sample location designation (e.g., 01)
- Sample bottom depth in inches (e.g., 0–6)

Examples:

- SS-02-(0-6): a soil sample collected at location 2, depth ground surface to 6 inches bgs
- SS-04-(0-6): a soil sample collected at location 4, depth ground surface to 6 inches bgs

The sample jar will then be logged on the chain-of-custody form, sealed in a Ziploc bag® (or equivalent), and placed in an insulated cooler containing wet ice.

4.2.3 Waste Characterization Sample

A composite soil sample will be collected by taking multiple grab samples from random locations in the accumulated soil pile and placing them in a clean plastic bowl or a new Ziploc® bag. The sample will then be broken up and homogenized with a plastic trowel or by hand while wearing nitrile gloves. Using gloved hands or the trowel, the sample will be transferred into a laboratory-supplied sterile, 8-ounce, wide-mouth glass jar and any additional containers required to support waste characterization required by the landfill. Immediately following sample collection, each glass jar will be capped with a screw-on Teflon-lined cap, wiped clean of dirt and moisture, and labeled with a unique sample identification number as described in Section 4.2.2 above.

4.2.4 Decontamination Procedures

Sample collection is anticipated to occur using disposable materials (i.e., disposal gloves and plastic bags). However, if trowels, scoops, mixing bowls, and other sampling equipment used during sampling come in direct contact with soil samples, they will be decontaminated between each usage. If needed, decontamination efforts will consist of a three-stage bucket system using an Alconox®-based detergent solution and double rinsing in distilled water.

The post-excavation confirmation soil samples will be submitted to an Arizona Department of Health Services licensed laboratory. The samples, including field duplicates, will be submitted for analysis of total lead via USEPA Method 6010C. The waste characterization sample will be analyzed for metals via the TCLP to decide whether constituent concentrations exhibit hazardous waste characteristics to determine whether the waste will be shipped off as hazardous waste or solid waste. Additional analyses may be performed on the waste characterization sample depending on the landfill disposal facility selected.

4.2.5 Quality Assurance Project Plan

The QAPP is intended to ensure that the evaluation and remediation activities described in the Work Plan generate complete and accurate data sets that have little bias and high precision that are

usable for the decision-making required to satisfy the project objectives. Implementation of the procedures in this QAPP will assure that data collected in the field and in the analytical laboratory are precise, accurate, representative, complete, and comparable to actual Site conditions.

All samples collected during field activities will be collected in clean, unused sample containers provided by the laboratory. All samples collected during the field activities will be submitted to the fixed-base laboratory and analyzed within the holding time designated for each analytical method. The sample containers, preservation, and holding times for each analytical method are presented in Table 4-1.

Table 4-1. Sample Containers, Preservation, and Holding Times

Parameter	USEPA Method	Container	Preservative	Holding Time
Baseline Parameters				
Lead	6010B/6010C	Glass jar	None	180 days
TCLP metals	1312/6010D	Glass jar	None	180 days

Immediately following collection, sample containers will be placed in Ziploc® bags (or equivalent) and then placed in an insulated cooler to be chilled using wet ice. The wet ice will be replenished as necessary to maintain the preservation temperature specified for the requested analytical method(s). The samples will be transported directly to the analytical laboratory via ground delivery or courier under appropriate chain-of-custody protocols within appropriate hold times. Chain-of-custody protocols will be used to ensure proper handling during sampling and analysis and to provide sample tracking. Samples and sample documentation will be maintained in the physical possession of authorized personnel or under control in a secure area. The purpose of sample custody procedures is to document the history of samples (and sample extracts or digestates) from the time of sample collection through shipment and analysis.

Field QC samples to be collected and analyzed in association with the remedial activities will include a blind field duplicate sample and a temperature blank. The purpose and frequency of collection for these field quality control samples are summarized below.

Internal laboratory QC samples typically include method blanks, MS/MSD samples, and laboratory control/laboratory control duplicate samples.

Field duplicate samples are used to check for sampling and analytical error, reproducibility, and homogeneity. One duplicate sample will be collected on a nominal basis of 1 per 10 confirmation samples. Duplicates will be analyzed for the same parameters specified for the associated confirmation samples. Additionally, a single MS/MSD pair will be collected and submitted for QC evaluation.

The QC goal for field duplicate follows: if the sample result for each sample is equal to or greater than five times the reporting limit, the relative percent difference (RPD) between sample results should be less than or equal to 50 percent. If at least one of the sample results is less than five times the reporting limit, the absolute difference between the results should be less than or equal to the higher of the reporting limits.

Data verification is primarily concerned with ensuring that complete, accurate, and consistent information is generated to characterize the physical conditions of a site and support a determination of usability of data to satisfy the project objectives. The verification of field data may also overlap portions of laboratory verification with respect to sample management. Field data verification will be performed by personnel familiar with the types of activities conducted and with respect to protocols stipulated in applicable regulatory guidance.

Laboratory data verification is confirmation by examination and provision of objective evidence that specified requirements have been fulfilled. Laboratory data verification is the process of evaluating the completeness, correctness, and conformance/compliance of a specific data set against the method, procedural, and regulatory requirements, or specifically by individual contract and separate assurance plans.

Data validation is an analyte- and sample-specific process that extends the evaluation of data beyond the method and the criteria identified in the verification process. Specifically, data validation is confirmation by examination and provision of objective evidence that the particular requirements for a specific intended use are fulfilled. The types of information that will be reviewed for validation of laboratory data are listed below:

- Laboratory report/documentation including case narrative
- Chain-of-custody
- Timeliness and errors
- Blanks and contamination (field and laboratory)
- Duplicate evaluation (field and laboratory)
- Accuracy (by evaluating MS/MSD and laboratory control samples recovery)
- Precision (by evaluating field and laboratory duplicate results)
- Laboratory qualifiers
- Quantitation and reported detection limits
- RPD (laboratory and field duplicate comparisons)
- Data use and overall quality assessment

Data validation will be in general accordance with USEPA's *Guidance on Environmental Data Verification and Data Validation (2002)*. Data validation will be performed on approximately 90 percent of the data for samples collected. Instrument calibration and raw data for the field and QC samples are not evaluated during the data validation process.

4.2.6 Permits Required

A Pima County Fugitive Dust Activity Permit will not be required since earthmoving activities are less than an acre. Similarly, a Pima County Stormwater Construction General Permit will not be required.

4.3 Soil Disposal

The waste characterization sample results will be used to secure approval for disposal of the material as a solid waste and/or hazardous waste as appropriate. The material will be managed, transported, and disposed of in accordance with federal, state, and local regulations.

4.4 Institutional Control

An institutional control will be established restricting the area to non-residential use. HVF will coordinate this task with ADEQ's Declaration of Environmental Use Restriction (DEUR) team.

Section 5

Community Involvement

The primary objective of the Community Relations Plan (CRP) is to document community involvement activities. These planned activities include public notices further described below.

5.1 Community Profile

For the purposes of this CRP, the community involvement area will be considered to include properties that adjoin/border the Site to the north, south, east, and west. Adjoining properties to the east and west are vacant. Davis-Monthan Air Force Base borders the site to the north. Drexel Road borders the site to the south. The site is fenced with security measures in place such that only authorized personnel may enter the premises.

5.2 Community Involvement Plan

Remediation field work proposed in this Report is limited to remediation activities to remove the extent of contaminants of concern in the soil. The planned remediation activities will not result in excessive noise, light, odor, dust, or other adverse impacts off the site.

As required by A.R.S. § 49-176.B, HVF will notify the public of anticipated efforts by placing a sign at the main facility entrance gate to the Site prior to commencing the remediation activities. The signage will remain in place throughout the duration of the field work. Appendix C includes a copy of the example signage that will be placed at the site.

As required by A.R.S. § 49-176(A)(3), HVF will coordinate and publish a notice in a newspaper of general circulation and allow for public comments to be submitted for a period of 45 days after the notice has been published.

Section 6

Schedule

HVF anticipates commencing implementation of the remediation activities described in this Report within 30 days of receiving approval from the ADEQ.

6.1 Progress Reports

HVF will notify the ADEQ when each of the following actions are complete:

- Public notice has been published in the newspaper
- Signage has been posted at the site entrance
- Soil excavation and disposal activities have been completed
- DEUR has been recorded.

HVF will request a No Further Action Determination following the required public notice and once the above activities have been completed.

Section 7

Conclusions

HVF is pleased to provide this Report as a summary of activities conducted in accordance with the Work Plan dated April 24, 2020, and approved by the ADEQ on May 4, 2020. Site characterization activities were conducted in May and June 2020.

The proposed remedial action will achieve the remediation levels and controls established pursuant to A.R.S. Title 49, Article 5, Section 175, Subsection B. [§ 49-175)(B)] as follows:

- The concentrations of cadmium, chromium, and mercury in soil meet predetermined risk based remedial standards for these metals specified in Title 18, Chapter 7, Section 205 for non-residential exposure assumptions.
- Following soil removal in the single area identified, the concentration of lead in soil will meet predetermined risk based remedial standards for lead specified in Title 18, Chapter 7, Section 205 for non-residential exposure assumptions.
- Based on the ADEQ's GPL guidance, the concentrations of cadmium, chromium, lead and mercury in soil will not cause or threaten to cause a violation of numeric Aquifer Water Quality Standards prescribed in Title 18, Chapter 11, Section 406.
- Pursuant to A.R.S. Title 49, Article 5, Section 152 B. [§ 49-152)(B)], HVF will record a DEUR limiting the remediation site to non-residential use.

Following the public comment period and recording of the DEUR, HVF will submit a Conditional No Further Action request to the ADEQ.

Section 8

Limitations

This document was prepared solely for HVF West, LLC in accordance with professional standards at the time the services were performed and in accordance with the contract between HVF West, LLC and Brown and Caldwell. This document is governed by the specific scope of work authorized by HVF West, LLC; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by HVF West, LLC and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Figures

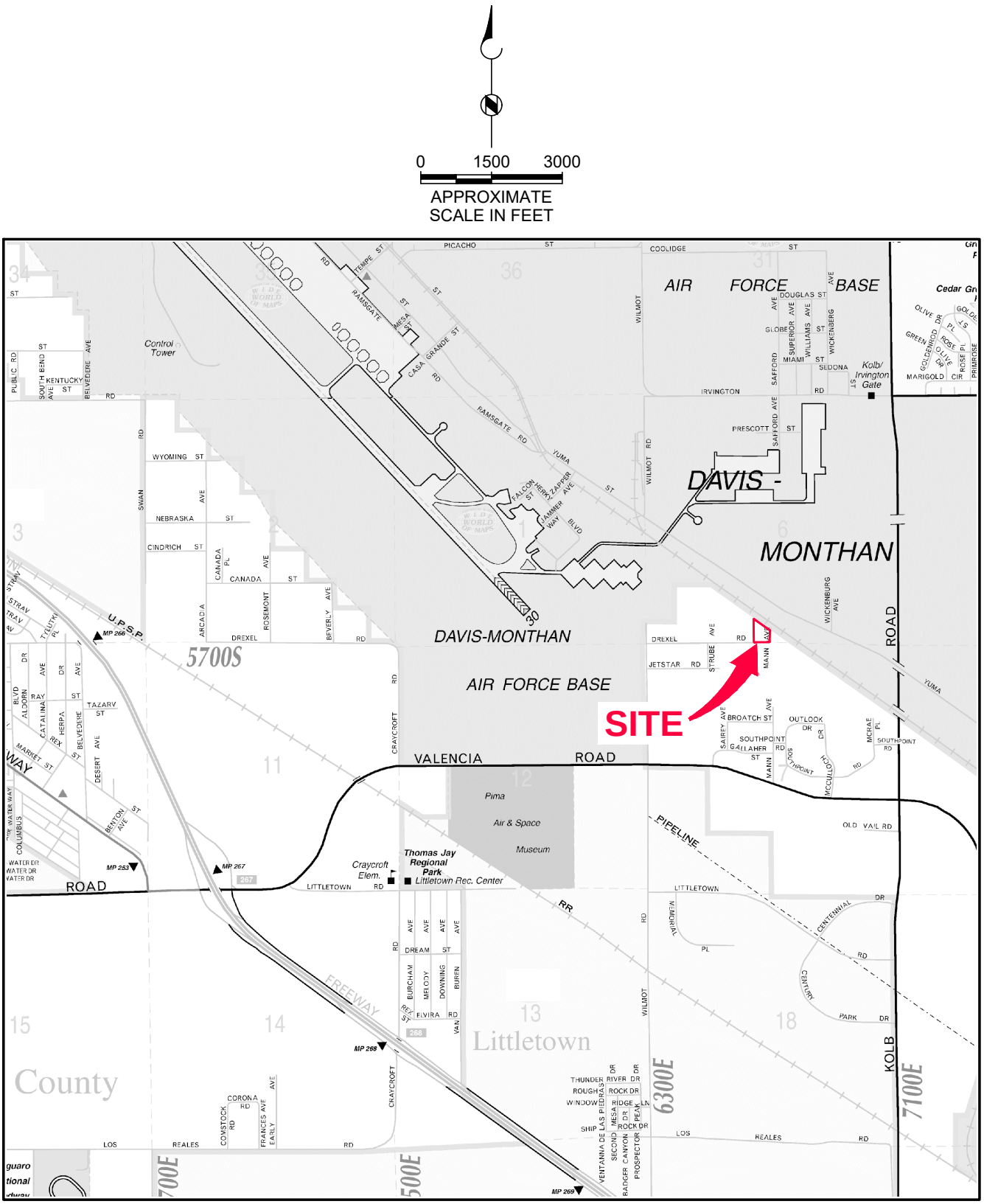

Figure 1

VICINITY MAP
FRITZ ENTERPRISES, INC.
HVF WEST LLC
6581 EAST DREXEL ROAD
TUCSON, ARIZONA 85756

Brown AND Caldwell

\\bcphxfp01\projects\Fritz Enterprises Inc\154686 - Site Investigation RCRA Support\GIS-CADD\Site Location Map\HVFWestFigure1.dwg Mar 12, 2020 - 5:45pm asantiago

EXPLANATION

1. SECURITY OFFICE
2. OFFICE
3. PAR□ING AREA
4. SHREDDER MILL

CHAIN-LIN□ FENCE

EARTHERN BERM

CONCRETE OR ASPHALT SURFACE

DAVIS-MONTHAN AIR FORCE BASE

SAMPLE GRID AREA

PARCEL 141-03-007B

FACILITY MAIN ENTRANCE

0 50 100

APPROXIMATE SCALE IN FEET

Figure 2

SITE MAP-PROCESSING AREA
FRITZ ENTERPRISES, INC.
HVF WEST LLC

6581 EAST DREXEL ROAD
TUCSON, ARIZONA 85756

Brown AND Caldwell

\\bcphxfp01\projects\Fritz Enterprises Inc\154489 - HVF West SPCC Update 2019\GIS-CADD\HVFWestFigure2_VRPP.dwg Apr 23, 2020 - 7:54pm asantiago

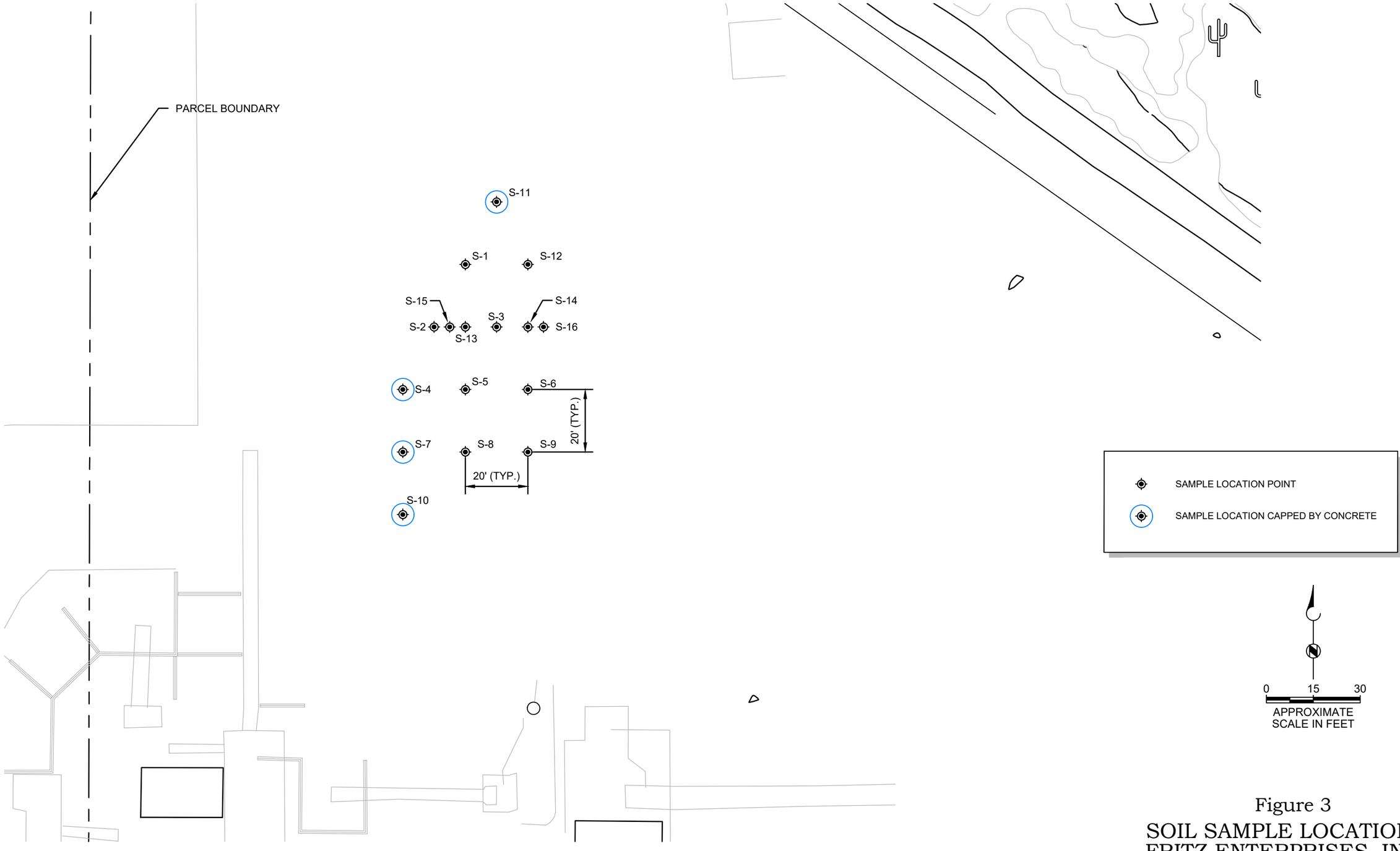

Figure 3

SOIL SAMPLE LOCATIONS
FRITZ ENTERPRISES, INC.
HVF WEST LLC

6581 EAST DREXEL ROAD
TUCSON, ARIZONA 85756

Brown AND Caldwell

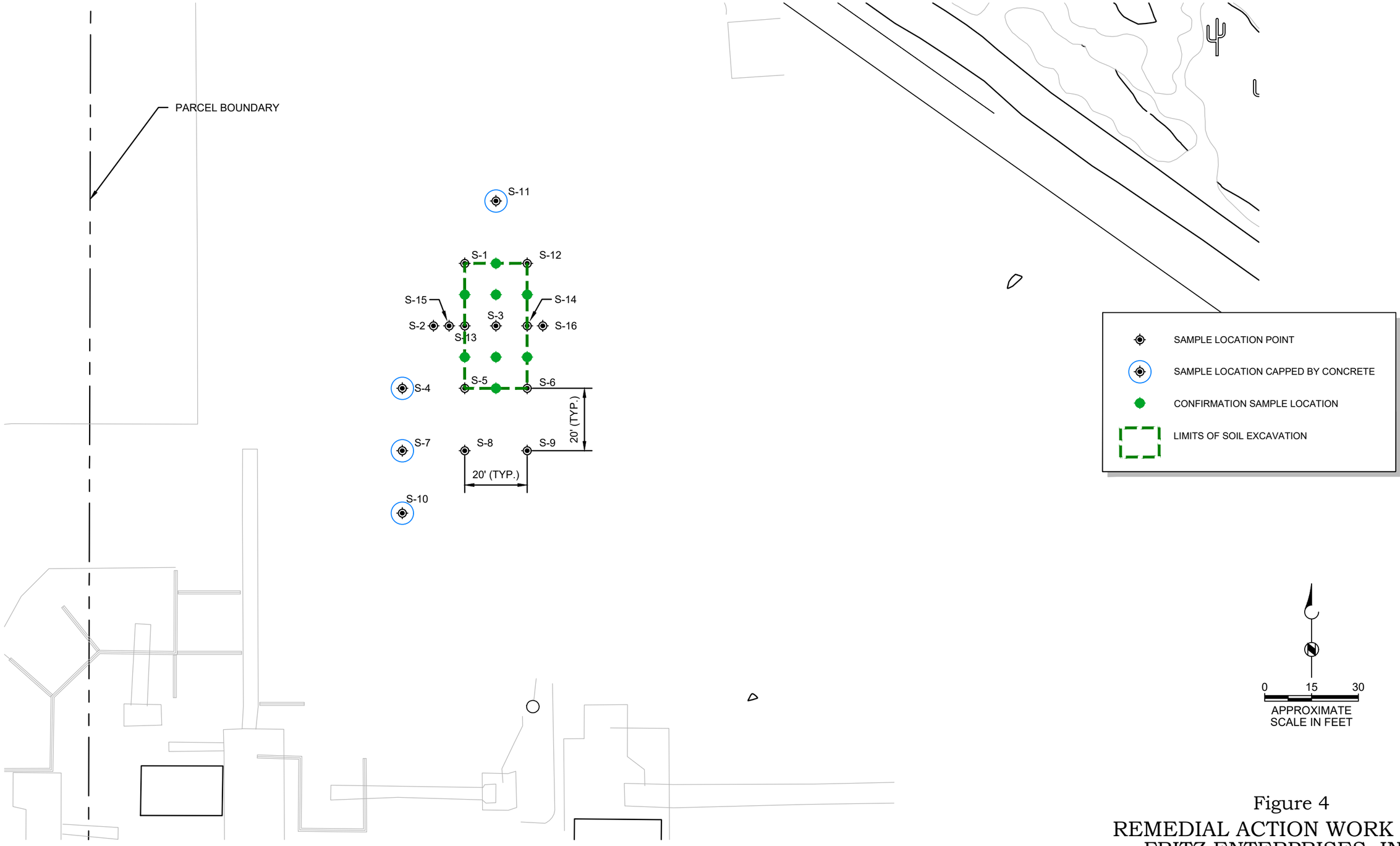

Figure 4

REMEDIAL ACTION WORK PLAN
FRITZ ENTERPRISES, INC.
HVF WEST LLC

6581 EAST DREXEL ROAD
TUCSON, ARIZONA 85756

Brown AND Caldwell

\\bcphxfp01\projects\Fritz Enterprises Inc\154686 - Site Investigation RCRA Support\GIS-CADD\154686_SamplingGrid.dwg Jun 24, 2020 - 8:44pm asantiago

Appendix A: Laboratory Analytical Reports

Brown AND Caldwell : LABORATORY DATA VERIFICATION AND VALIDATION FORM

1. PROJECT INFORMATION

Date: 6/24/20

Project Number: 154686 **Project Name/Client:** Fritz Enterprises, Inc.

Project Manager: Matthew Frailey **Sampled by:** H. Schultz

Laboratory: Pace Analytical **Report No.:** L1222632

2. SAMPLE INFORMATION

Purpose of sampling: Soil Sampling **Sample Date:** 5/26/20

Total number of samples: 13

☐ Groundwater		☑ Soil	12	☐ Soil Gas		☐ Trip Blank	
☐ Surface water		☐ Sediment		☐ Other		☐ Field Blank	
☐ Drinking water		☐ Air		☐ Other		☑ Equip Blank	1

Analyses requested: Total Metals - Cd, Cr, Pb, Hg (6010D/7471B); Hexavalent Chromium (3060A/7196A)

Laboratory limits requested (MDLS, PQL, RL, etc.): RDL, MDL

Duplicates: Dup-1 = S-11-(0-6)

3. DATA VERIFICATION

Check Yes/No/NA. Refer to applicable Data Verification Guidelines to determine appropriate action.

☑ **Yes** ☐ **No** ☐ **NA Was the Chain of Custody intact?**
If no, notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Were custody seals intact on samples bottles and/or coolers as necessary?**
If no, notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Were cooler temperatures within the acceptable range?**
If no, notes: No issues to report

☐ **Yes** ☑ **No** ☐ **NA Were samples physically and chemically preserved properly? (no headspace in VOC vials, proper pH, etc.)**
If no, notes: Comment 1

☑ **Yes** ☐ **No** ☐ **NA Does the case narrative appropriately address all quality issues and discrepancies?**
If no, notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Were all samples labeled, analyzed, and reported correctly? (no samples held, no wrong analyses, etc.)**
If no, call lab immediately to verify. Notes: No issues to report

☐ **Yes** ☑ **No** ☐ **NA Were all samples analyzed within holding time?**
If no, notes: Comment 2

☑ **Yes** ☐ **No** ☐ **NA Were appropriate analytes reported?**
If no, notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Were soil and/or sediment concentrations reported appropriately? (DW vs WW)**
If no, call lab immediately to verify. Notes: Wet basis

☐ **Yes** ☐ **No** ☑ **NA If analyzed for the following parameters, was the following true for all analytes?**

- ☐ Yes ☐ No ☑ NA Total metals ≥ Dissolved metals
- ☐ Yes ☐ No ☑ NA TKN > Organic nitrogen
- ☐ Yes ☐ No ☑ NA TKN > Ammonia (NH_3)
- ☐ Yes ☐ No ☑ NA COD > TOC
- ☐ Yes ☐ No ☑ NA COD > BOD

If no: Report to project manager and contact lab's QA/QC manager if needed. Notes: None

☑ **Yes** ☐ **No** ☐ **NA Were method detection limits (MDL), reporting limits (RLs), and/or dilution factors appropriate?**
If no: Report to project manager and contact lab if needed. Notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Were any target analytes detected below practical quantitation limits (PQL) or reporting limits (RL)?**
If yes, notes: Lab qualifier, E4, indicates results below the PQL and results are considered estimated, J

☐ **Yes** ☑ **No** ☐ **NA Were target analytes detected in any equipment, field, trip, and/or laboratory method blanks?**
If yes, notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Were any sample duplicates collected?**
If no, notes: Comment 3

☐ **Yes** ☐ **No** ☑ **NA Were surrogate % recoveries within the acceptable range of LCL ≤ x ≤ UCL?**
If no, notes: None

☑ **Yes** ☐ **No** ☐ **NA Were any laboratory duplicates reported for project samples?**
If yes, notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Were any matrix spike or matrix spike duplicates (MS/MSD) reported for project samples?**
If yes, notes: Comment 4

☑ **Yes** ☐ **No** ☐ **NA Were any laboratory control samples (LCS) or Blank Spikes reported?**
If yes, notes: No issues to report

☐ **Yes** ☑ **No** ☐ **NA Were calibration standards reported (ICV, CCV, Internal Standards)?**
If yes, notes: None

4. COMMENTS & SUMMARY OF ACTIONS TAKEN (Attach additional pages if necessary)

Comment 1: Sample Equip Blank was received outside of the proper pH. Sample pH was adjusted and analysis proceeded.

Comment 2: Sample Equip Blank was analyzed outside of the 24-hour method holding time for hexavalent chromium. The analysis occurred within 2 times the method holding time and associated sample non-detections are qualified as estimated with limited detection, UJ, reason code 1.

Comment 3: Dup-1 is the sample field duplicate for S-11-(0-6). All calculated RPDs were within control limits. See page 3 for more details.

Comment 4: The MS/MSD percent recoveries for sample S-1-(0-6) were above control limits and the MS/MSD RPD was above the control limit for mercury, cadmium, chromium, and lead. Associated parent sample detections are qualified as estimated, J, reason codes 4H,5.

C. Woodlee
Signature of Data Validator(s)

Reviewer Initials _____

LABORATORY DATA VERIFICATION

Sample Duplicate Comparison

PROJECT INFORMATION

Project Number: 154686 **Project Name:** Site Investigation **Task/Purpose of Sampling:** Soil Sampling
Project Manager: Matthew Frailey **Client:** Fritz Enterprises, Inc.
Laboratory: Pace Analytical **Data Report:** L1222632

DUPLICATE INFORMATION

Parent Sample ID: S-11-(0-6) **Date/Time:** 5/26/2020 9:20 **Matrix:** SO
Duplicate Sample ID: Dup-01 **Date/Time:** 5/26/2020 12:00 **Matrix:** SO

Analytes (Units)	Analytical Results[a]		Relative Percent Difference (RPD) Comparison		Method Detection Limit (MDL) Comparison (If Needed)					Actions Required
					S-11-(0-6)		Dup-01		If RPD>%: Either Sample Conc. ≥ 5X MDLs?	
	S-11-(0-6)	Dup-01	RPD	Inorg: RPD > 20%? Org: RPD > 30%?	MDL	5x MDL	MDL	5x MDL		
Mercury	*0.0180*	0.0297	49%	**YES**	0.0180	0	0.0180	0	**NO**	No further action required
Cadmium	0.573	0.523	9%	**NO**	0.250	1	0.250	1		No further action required
Chromium	19.3	20.3	5%	**NO**	0.500	3	0.500	3		No further action required
Lead	12.8	13.6	6%	**NO**	0.25	1	0.25	1		No further action required

[a] Results in red text and italics were below reporting limits. Values are reporting limits for comparison purposes only.

Relative Percent Difference (RPD) is a quantitative indicator of quality assurance and quality control (QA/QC) for repeated measurements (i.e. duplicates) where the outcome is expected to be the same. It is calculated using the following equation:

$$RPD = \left| \frac{x_1 - x_2}{(x_1 + x_2)/2} \right| \times 100$$

Initials CRW

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

June 03, 2020

Brown & Caldwell - Phoenix, AZ

Sample Delivery Group:	L1222632
Samples Received:	05/28/2020
Project Number:	154686
Description:	HVF West

Report To: Matthew Frailey
2 North Central Ave Suite 1600
Phoenix, AZ 85004

Entire Report Reviewed By: Daphne R Richards

Daphne Richards
Project Manager

S-1-(0-6) L1222632-01 Solid

Collected by: Harrison Schultz | Collected date/time: 05/26/20 09:45 | Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 3060A/7196A	WG1484450	1	06/02/20 11:00	06/03/20 10:53	JIC	Mt. Juliet, TN
Mercury by Method 7471B	WG1484433	1	05/29/20 21:08	06/01/20 10:13	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1484448	1	05/30/20 08:47	05/31/20 14:58	CCE	Mt. Juliet, TN

S-3-(0-6) L1222632-02 Solid

Collected by: Harrison Schultz | Collected date/time: 05/26/20 10:10 | Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 3060A/7196A	WG1484450	1	06/02/20 11:00	06/03/20 10:56	JIC	Mt. Juliet, TN
Mercury by Method 7471B	WG1484433	1	05/29/20 21:08	06/01/20 10:44	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1484448	1	05/30/20 08:47	05/31/20 15:32	CCE	Mt. Juliet, TN

S-4-(0-6) L1222632-03 Solid

Collected by: Harrison Schultz | Collected date/time: 05/26/20 09:10 | Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 3060A/7196A	WG1484450	1	06/02/20 11:00	06/03/20 10:56	JIC	Mt. Juliet, TN
Mercury by Method 7471B	WG1484433	1	05/29/20 21:08	06/01/20 10:46	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1484448	1	05/30/20 08:47	05/31/20 15:34	CCE	Mt. Juliet, TN

S-5-(0-6) L1222632-04 Solid

Collected by: Harrison Schultz | Collected date/time: 05/26/20 10:35 | Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 3060A/7196A	WG1484450	1	06/02/20 11:00	06/03/20 10:56	JIC	Mt. Juliet, TN
Mercury by Method 7471B	WG1484433	1	05/29/20 21:08	06/01/20 10:49	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1484448	1	05/30/20 08:47	05/31/20 15:37	CCE	Mt. Juliet, TN

S-6-(0-6) L1222632-05 Solid

Collected by: Harrison Schultz | Collected date/time: 05/26/20 10:25 | Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 3060A/7196A	WG1484450	1	06/02/20 11:00	06/03/20 10:59	JIC	Mt. Juliet, TN
Mercury by Method 7471B	WG1484433	1	05/29/20 21:08	06/01/20 10:51	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1484448	1	05/30/20 08:47	05/31/20 15:40	CCE	Mt. Juliet, TN

S-7-(0-6) L1222632-06 Solid

Collected by: Harrison Schultz | Collected date/time: 05/26/20 08:55 | Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 3060A/7196A	WG1484450	1	06/02/20 11:00	06/03/20 11:00	JIC	Mt. Juliet, TN
Mercury by Method 7471B	WG1484433	1	05/29/20 21:08	06/01/20 10:54	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1484448	1	05/30/20 08:47	05/31/20 15:42	CCE	Mt. Juliet, TN

S-8-(0-6) L1222632-07 Solid

Collected by: Harrison Schultz | Collected date/time: 05/26/20 11:25 | Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 3060A/7196A	WG1484450	1	06/02/20 11:00	06/03/20 11:00	JIC	Mt. Juliet, TN
Mercury by Method 7471B	WG1484433	1	05/29/20 21:08	06/01/20 10:56	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1484448	1	05/30/20 08:47	05/31/20 15:45	CCE	Mt. Juliet, TN

S-9-(0-6) L1222632-08 Solid

Collected by: Harrison Schultz | Collected date/time: 05/26/20 11:15 | Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 3060A/7196A	WG1484450	1	06/02/20 11:00	06/03/20 11:01	JIC	Mt. Juliet, TN
Mercury by Method 7471B	WG1484433	1	05/29/20 21:08	06/01/20 10:58	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1484448	1	05/30/20 08:47	05/31/20 15:47	CCE	Mt. Juliet, TN

S-10-(0-6) L1222632-09 Solid

Collected by: Harrison Schultz | Collected date/time: 05/26/20 08:40 | Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 3060A/7196A	WG1484450	1	06/02/20 11:00	06/03/20 11:02	JIC	Mt. Juliet, TN
Mercury by Method 7471B	WG1484433	1	05/29/20 21:08	06/01/20 11:01	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1484448	1	05/30/20 08:47	05/31/20 15:50	CCE	Mt. Juliet, TN

S-11-(0-6) L1222632-10 Solid

Collected by: Harrison Schultz | Collected date/time: 05/26/20 09:20 | Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 3060A/7196A	WG1484450	1	06/02/20 11:00	06/03/20 11:02	JIC	Mt. Juliet, TN
Mercury by Method 7471B	WG1484433	1	05/29/20 21:08	06/01/20 11:03	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1484448	1	05/30/20 08:47	05/31/20 16:06	CCE	Mt. Juliet, TN

S-12-(0-6) L1222632-11 Solid

Collected by: Harrison Schultz | Collected date/time: 05/26/20 09:27 | Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 3060A/7196A	WG1484450	1	06/02/20 11:00	06/03/20 11:02	JIC	Mt. Juliet, TN
Mercury by Method 7471B	WG1484433	1	05/29/20 21:08	06/01/20 11:10	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1484448	1	05/30/20 08:47	05/31/20 16:09	CCE	Mt. Juliet, TN

DUP-1 L1222632-12 Solid

Collected by: Harrison Schultz | Collected date/time: 05/26/20 12:00 | Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 3060A/7196A	WG1484450	1	06/02/20 11:00	06/03/20 11:03	JIC	Mt. Juliet, TN
Mercury by Method 7471B	WG1484433	1	05/29/20 21:08	06/01/20 11:13	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1484448	1	05/30/20 08:47	05/31/20 16:12	CCE	Mt. Juliet, TN

EQUIP BLANK L1222632-16 GW

Collected by: Harrison Schultz
Collected date/time: 05/26/20 14:00
Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1483517	1	05/28/20 12:48	05/28/20 12:48	KEG	Mt. Juliet, TN
Mercury by Method 7470A	WG1483846	1	05/28/20 21:00	05/29/20 10:08	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1483879	1	05/31/20 16:30	06/01/20 08:52	EL	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Daphne R Richards

Daphne Richards
Project Manager

Sample Delivery Group (SDG) Narrative

Sample was prepared and/or analyzed past holding time as defined in the method. Concentrations should be considered minimum values.

Lab Sample ID	Project Sample ID	Method
L1222632-16	EQUIP BLANK	7196A

Wet Chemistry by Method 3060A/7196A

Analyte		Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg		date / time	
Chromium,Hexavalent		1.50	E4	0.640	2.00	1	06/03/2020 10:53	WG1484450

Mercury by Method 7471B

Analyte		Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg		date / time	
Mercury	J, RC:4H,5	0.383	M1 R5	0.0180	0.0400	1	06/01/2020 10:13	WG1484433

Metals (ICP) by Method 6010D

Analyte		Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
		mg/kg		mg/kg	mg/kg		date / time	
Cadmium	J, RC:4H,5	124	M2 R5	0.250	0.500	1	05/31/2020 14:58	WG1484448
Chromium	J, RC:4H,5	198	M1 M2 R5	0.500	1.00	1	05/31/2020 14:58	WG1484448
Lead	J, RC:4H,5	409	M3 R5	0.250	0.500	1	05/31/2020 14:58	WG1484448

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	1.08	E4	0.640	2.00	1	06/03/2020 10:56	WG1484450

Mercury by Method 7471B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	1.51		0.0180	0.0400	1	06/01/2020 10:44	WG1484433

Metals (ICP) by Method 6010D

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Cadmium	298		0.250	0.500	1	05/31/2020 15:32	WG1484448
Chromium	349		0.500	1.00	1	05/31/2020 15:32	WG1484448
Lead	5220		0.250	0.500	1	05/31/2020 15:32	WG1484448

Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Chromium,Hexavalent	U		0.640	2.00	1	06/03/2020 10:56	WG1484450

Mercury by Method 7471B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	U		0.0180	0.0400	1	06/01/2020 10:46	WG1484433

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Cadmium	0.554		0.250	0.500	1	05/31/2020 15:34	WG1484448
Chromium	14.5		0.500	1.00	1	05/31/2020 15:34	WG1484448
Lead	11.0		0.250	0.500	1	05/31/2020 15:34	WG1484448

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	0.667	E4	0.640	2.00	1	06/03/2020 10:56	WG1484450

Mercury by Method 7471B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0330	E4	0.0180	0.0400	1	06/01/2020 10:49	WG1484433

Metals (ICP) by Method 6010D

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Cadmium	3.72		0.250	0.500	1	05/31/2020 15:37	WG1484448
Chromium	18.4		0.500	1.00	1	05/31/2020 15:37	WG1484448
Lead	21.4		0.250	0.500	1	05/31/2020 15:37	WG1484448

Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Chromium,Hexavalent	11.3		0.640	2.00	1	06/03/2020 10:59	WG1484450

Mercury by Method 7471B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	1.21		0.0180	0.0400	1	06/01/2020 10:51	WG1484433

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Cadmium	107		0.250	0.500	1	05/31/2020 15:40	WG1484448
Chromium	282		0.500	1.00	1	05/31/2020 15:40	WG1484448
Lead	320		0.250	0.500	1	05/31/2020 15:40	WG1484448

Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Chromium,Hexavalent	U		0.640	2.00	1	06/03/2020 11:00	WG1484450

Mercury by Method 7471B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	0.0940		0.0180	0.0400	1	06/01/2020 10:54	WG1484433

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Cadmium	11.4		0.250	0.500	1	05/31/2020 15:42	WG1484448
Chromium	35.7		0.500	1.00	1	05/31/2020 15:42	WG1484448
Lead	36.2		0.250	0.500	1	05/31/2020 15:42	WG1484448

Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Chromium,Hexavalent	U		0.640	2.00	1	06/03/2020 11:00	WG1484450

Mercury by Method 7471B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	0.202		0.0180	0.0400	1	06/01/2020 10:56	WG1484433

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Cadmium	32.9		0.250	0.500	1	05/31/2020 15:45	WG1484448
Chromium	1130		0.500	1.00	1	05/31/2020 15:45	WG1484448
Lead	106		0.250	0.500	1	05/31/2020 15:45	WG1484448

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	0.833	E4	0.640	2.00	1	06/03/2020 11:01	WG1484450

Mercury by Method 7471B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0586		0.0180	0.0400	1	06/01/2020 10:58	WG1484433

Metals (ICP) by Method 6010D

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Cadmium	14.7		0.250	0.500	1	05/31/2020 15:47	WG1484448
Chromium	34.8		0.500	1.00	1	05/31/2020 15:47	WG1484448
Lead	67.8		0.250	0.500	1	05/31/2020 15:47	WG1484448

Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Chromium,Hexavalent	5.48		0.640	2.00	1	06/03/2020 11:02	WG1484450

Mercury by Method 7471B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	0.220		0.0180	0.0400	1	06/01/2020 11:01	WG1484433

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Cadmium	35.5		0.250	0.500	1	05/31/2020 15:50	WG1484448
Chromium	63.5		0.500	1.00	1	05/31/2020 15:50	WG1484448
Lead	88.0		0.250	0.500	1	05/31/2020 15:50	WG1484448

Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Chromium,Hexavalent	U		0.640	2.00	1	06/03/2020 11:02	WG1484450

Mercury by Method 7471B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	U		0.0180	0.0400	1	06/01/2020 11:03	WG1484433

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Cadmium	0.573		0.250	0.500	1	05/31/2020 16:06	WG1484448
Chromium	19.3		0.500	1.00	1	05/31/2020 16:06	WG1484448
Lead	12.8		0.250	0.500	1	05/31/2020 16:06	WG1484448

Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Chromium,Hexavalent	9.92		0.640	2.00	1	06/03/2020 11:02	WG1484450

Mercury by Method 7471B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	1.29		0.0180	0.0400	1	06/01/2020 11:10	WG1484433

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Cadmium	237		0.250	0.500	1	05/31/2020 16:09	WG1484448
Chromium	370		0.500	1.00	1	05/31/2020 16:09	WG1484448
Lead	752		0.250	0.500	1	05/31/2020 16:09	WG1484448

Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Chromium,Hexavalent	U		0.640	2.00	1	06/03/2020 11:03	WG1484450

Mercury by Method 7471B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	0.0297	E4	0.0180	0.0400	1	06/01/2020 11:13	WG1484433

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Cadmium	0.523		0.250	0.500	1	05/31/2020 16:12	WG1484448
Chromium	20.3		0.500	1.00	1	05/31/2020 16:12	WG1484448
Lead	13.6		0.250	0.500	1	05/31/2020 16:12	WG1484448

Wet Chemistry by Method 7196A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chromium,Hexavalent	U	UJ, RC:1	3.00	10.0	1	05/28/2020 12:48	WG1483517

Mercury by Method 7470A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Mercury	U		0.100	0.200	1	05/29/2020 10:08	WG1483846

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Cadmium	U		0.563	2.00	1	06/01/2020 08:52	WG1483879
Chromium	U		5.00	10.0	1	06/01/2020 08:52	WG1483879
Lead	U		2.95	6.00	1	06/01/2020 08:52	WG1483879

Method Blank (MB)

(MB) R3534505-1 06/03/20 10:52

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Chromium,Hexavalent	U		0.640	2.00

L1222632-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1222632-05 06/03/20 10:59 • (DUP) R3534505-7 06/03/20 11:00

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	11.3	11.4	1	1.25		20

L1222632-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1222632-11 06/03/20 11:02 • (DUP) R3534505-8 06/03/20 11:02

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	9.92	10.0	1	0.800		20

Laboratory Control Sample (LCS)

(LCS) R3534505-2 06/03/20 10:52

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chromium,Hexavalent	24.0	24.5	102	80.0-120	

L1222632-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1222632-01 06/03/20 10:53 • (MS) R3534505-3 06/03/20 10:53 • (MSD) R3534505-4 06/03/20 10:54

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chromium,Hexavalent	20.0	1.50	16.7	17.0	75.9	77.4	1	75.0-125			1.76	20

L1222632-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1222632-01 06/03/20 10:53 • (MS) R3534505-5 06/03/20 10:54

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chromium,Hexavalent	637	1.50	591	92.7	50	75.0-125	

Method Blank (MB)

(MB) R3532561-1 05/28/20 12:46

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Chromium,Hexavalent	U		3.00	10.0

L1222632-16 Original Sample (OS) • Duplicate (DUP)

(OS) L1222632-16 05/28/20 12:48 • (DUP) R3532561-3 05/28/20 12:48

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chromium,Hexavalent	U	U	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3532561-2 05/28/20 12:47

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Chromium,Hexavalent	500	470	94.0	80.0-120	

L1222715-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1222715-02 05/28/20 12:50 • (MS) R3532561-4 05/28/20 12:51 • (MSD) R3532561-5 05/28/20 12:51

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Chromium,Hexavalent	500	U	450	451	90.0	90.2	1	85.0-115			0.222	20

Method Blank (MB)

(MB) R3532971-1 05/29/20 09:41

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Mercury	U		0.100	0.200

Laboratory Control Sample (LCS)

(LCS) R3532971-2 05/29/20 09:44

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	3.00	2.82	94.1	80.0-120	

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) • (MS) R3532971-3 05/29/20 09:49 • (MSD) R3532971-4 05/29/20 09:51

Analyte	Spike Amount ug/l	Original Result	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	3.00		2.72	2.76	90.8	91.9	1	75.0-125			1.18	20

Method Blank (MB)

(MB) R3533723-1 06/01/20 10:04

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3533723-2 06/01/20 10:06

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.500	0.483	96.7	80.0-120	

L1222632-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1222632-01 06/01/20 10:13 • (MS) R3533723-3 06/01/20 10:16 • (MSD) R3533723-4 06/01/20 10:18

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.500	0.383	1.05	1.32	133	188	1	75.0-125	M1	M1 R5	22.9	20

Method Blank (MB)

(MB) R3533920-1 06/01/20 07:40

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Cadmium	U		0.563	2.00
Chromium	U		5.00	10.0
Lead	U		2.95	6.00

Laboratory Control Sample (LCS)

(LCS) R3533920-2 06/01/20 07:43

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Cadmium	1000	966	96.6	80.0-120	
Chromium	1000	957	95.7	80.0-120	
Lead	1000	960	96.0	80.0-120	

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) • (MS) R3533920-4 06/01/20 07:51 • (MSD) R3533920-5 06/01/20 07:53

Analyte	Spike Amount ug/l	Original Result	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Cadmium	1000		979	964	97.9	96.4	1	75.0-125			1.57	20
Chromium	1000		964	952	96.4	95.2	1	75.0-125			1.28	20
Lead	1000		970	962	97.0	96.2	1	75.0-125			0.883	20

Method Blank (MB)

(MB) R3533608-1 05/31/20 14:53

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Cadmium	U		0.250	0.500
Chromium	U		0.500	1.00
Lead	U		0.250	0.500

Laboratory Control Sample (LCS)

(LCS) R3533608-2 05/31/20 14:55

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Cadmium	100	97.4	97.4	80.0-120	
Chromium	100	100	100	80.0-120	
Lead	100	99.1	99.1	80.0-120	

L1222632-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1222632-01 05/31/20 14:58 • (MS) R3533608-5 05/31/20 15:06 • (MSD) R3533608-6 05/31/20 15:09

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Cadmium	100	124	171	240	47.2	115	1	75.0-125	M2	R5	33.2	20
Chromium	100	198	236	326	38.1	128	1	75.0-125	M2	M1 R5	31.9	20
Lead	100	409	333	1970	0.000	1560	1	75.0-125	M3	M3 R5	142	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
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Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E4	Concentration estimated. Analyte was detected below laboratory minimum reporting level (MRL) but above MDL.
M1	Matrix spike recovery was high, the method control sample recovery was acceptable.
M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike recovery was acceptable.
R5	MS/MSD RPD exceeded the laboratory acceptance limit. Recovery met acceptance criteria.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
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State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

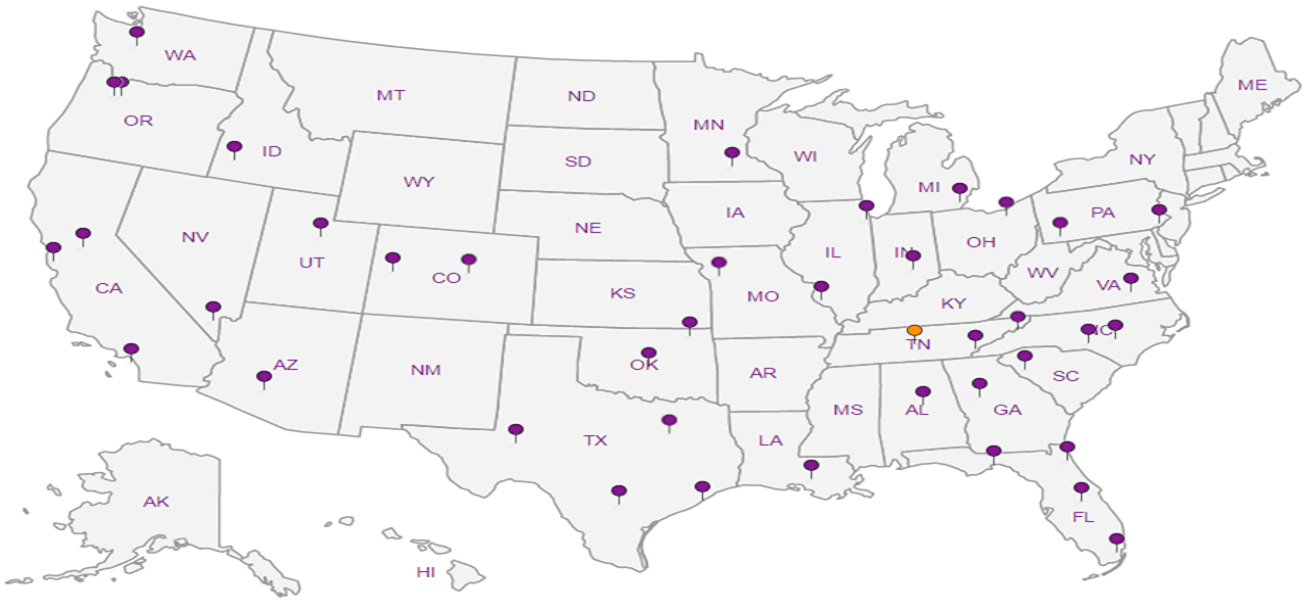
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Brown & Caldwell
2 North Central Avenue
Suite 1600
Phoenix, Arizona 85004

Billing Information:

Pres Chk

Report to: **Matthew Frailey**

Email To: **mfrailey@BrwnCald.com**

Project Description: **HVF West**

City/State Collected: Tucson, AZ

Phone: **602-567-3844**
Fax:

Client Project # 154686

Lab Project #

Collected by (print): Harrison Schultz

Site/Facility ID # HVF West

P.O. #

Collected by (signature): Harrison Schultz

Immediately Packed on Ice N___ Y✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote # 77143

Date Results Needed: Normal TAT

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1222632

F170

Template:
Prelogin:
TSR:
PB:
Shipped Via:

HS	Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Hexavalent Chromium 3060A/7196A	Total Metals (Cd, Cr, Pb, Hg) 6010C/7471	Remarks	Sample # (lab only)
S-1	S-1-(06)	Comp	SS	0-6"	5-26-20	0945	2	X	X		01
S-3	S-3-(06)					1010	2				02
S-4	S-4-(06)					0910	2				03
S-5	S-5-(06)					1035	2				04
S-6	S-6-(06)					1025	2				05
S-7	S-7-(06)					0855	2				06
S-8	S-8-(06)					1125	2				07
S-9	S-9-(06)					1115	2				08
S-10	S-10-(06)					0840	2				09
S-11	S-11-(0-6)	↓	↓	↓	↓	0920	2	↓	↓		10

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__UPS __FedEx __Courier _____

Tracking # SWA

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD SCREEN: <0.5 mR/hr

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	5/27/20	1545	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	5/27/20	1800	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 1.7 °C Bottles Received: 18
1.5-2=13

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Date: 5/28/20 Time: 08:00

PNPAZ

Brown & Caldwell
2 North Central Avenue
Suite 1600
Phoenix, Arizona 85004

Billing Information:

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Report to: **Matthew Frailey**

Email To: **mfrailey@BrwnCald.com**

Project Description: **HVF West**

City/State Collected: Tucson, AZ

Phone: **602-567-3844**
Fax:

Client Project # 154686

Lab Project #

L # 122692

Collected by (print): Harrison Schultz

Site/Facility ID # HVF West

P.O. #

Table #

Acctnum: **BROCAPAZ**

Collected by (signature): Harrison Schultz

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote # 77143

Date Results Needed: Normal TAT

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Hexavalent Chromium 3060A/7196A	Total Metals (Cd, Cr, Pb, Hg) 6010C/7471	Remarks	Sample # (lab only)
S-12 (0-6)	Comp	SS	0-6"	5-26-20	0927	2	X	X		11
S-1-MS	↓	↓	↓	↓	0945	↓	↓	↓		01
S-1-MSD	↓	↓	↓	↓	0945	↓	↓	↓		01
DUP-1	↓	↓	↓	↓	1200	2	X	X		12
Equip Blank	Comp	DW (DI-W)	NA	5/26/20	1400	1	X	X		

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other*

Remarks: OK to run hex chrome eq. blank OOH

pH ___ Temp ___

Flow ___ Other ___

Samples returned via:
__ UPS __ FedEx __ Courier ___

Tracking # SWA

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD SCREEN: <0.5 mR/hr

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Matthew Frailey	5/27/20	1545	
	5/27/20	1800	

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 8.1 °C Bottles Received: 29
4.5-2=1.3

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Received for lab by: (Signature) L. Webster
Date: 5/28/20 Time: 08:00

DNRAD

Matt Shacklock

Login #:1222632	Client: BROCAPAZ	Date:5/28	Evaluated by:Matt Shacklock

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
x	Parameter(s) past holding time		Login Clarification Needed		**If Broken Container:**
	Temperature not in range		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
x	pH not in range.		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Couri
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: For Equip Blank we received Metals unpreserved

Nitric Lot # 19L04452

Client informed by:		Call		Email		Voice Mail		Date: 5/28	Time: 0938
TSR Initials: DR	Client Contact:								

Login Instructions:

Preserve as needed and proceed with analysis

Brown AND Caldwell : LABORATORY DATA VERIFICATION AND VALIDATION FORM

1. PROJECT INFORMATION

Date: 6/24/20

Project Number: 154686 **Project Name/Client:** Fritz Enterprises, Inc.

Project Manager: Matthew Frailey **Sampled by:** H. Schultz

Laboratory: Pace Analytical **Report No.:** L1225459

2. SAMPLE INFORMATION

Purpose of sampling: Soil Sampling **Sample Date:** 5/26/20

Total number of samples: 1

☐ Groundwater		☑ Soil	1	☐ Soil Gas		☐ Trip Blank	
☐ Surface water		☐ Sediment		☐ Other		☐ Field Blank	
☐ Drinking water		☐ Air		☐ Other		☐ Equip Blank	

Analyses requested: Lead 6010D

Laboratory limits requested (MDLS, PQL, RL, etc.): RDL, MDL

Duplicates: None

3. DATA VERIFICATION

Check Yes/No/NA. Refer to applicable Data Verification Guidelines to determine appropriate action.

☑ Yes ☐ No ☐ NA **Was the Chain of Custody intact?**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Were custody seals intact on samples bottles and/or coolers as necessary?**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Were cooler temperatures within the acceptable range?**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Were samples physically and chemically preserved properly? (no headspace in VOC vials, proper pH, etc.)**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Does the case narrative appropriately address all quality issues and discrepancies?**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Were all samples labeled, analyzed, and reported correctly? (no samples held, no wrong analyses, etc.)**
If no, call lab immediately to verify. Notes: Comment 1

☑ Yes ☐ No ☐ NA **Were all samples analyzed within holding time?**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Were appropriate analytes reported?**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Were soil and/or sediment concentrations reported appropriately? (DW vs WW)**
If no, call lab immediately to verify. Notes: Wet basis

☐ Yes ☐ No ☑ NA **If analyzed for the following parameters, was the following true for all analytes?**

- ☐ Yes ☐ No ☑ NA Total metals ≥ Dissolved metals
- ☐ Yes ☐ No ☑ NA TKN > Organic nitrogen
- ☐ Yes ☐ No ☑ NA TKN > Ammonia (NH_3)
- ☐ Yes ☐ No ☑ NA COD > TOC
- ☐ Yes ☐ No ☑ NA COD > BOD

If no: Report to project manager and contact lab's QA/QC manager if needed. Notes: None

☑ Yes ☐ No ☐ NA **Were method detection limits (MDL), reporting limits (RLs), and/or dilution factors appropriate?**
If no: Report to project manager and contact lab if needed. Notes: No issues to report

☐ Yes ☑ No ☐ NA **Were any target analytes detected below practical quantitation limits (PQL) or reporting limits (RL)?**
If yes, notes: No issues to report

☐ Yes ☑ No ☐ NA **Were target analytes detected in any equipment, field, trip, and/or laboratory method blanks?**
If yes, notes: No issues to report

Initials CRW

☐ **Yes** ☑ **No** ☐ **NA Were any sample duplicates collected?**
If no, notes: None

☐ **Yes** ☐ **No** ☑ **NA Were surrogate % recoveries within the acceptable range of LCL ≤ x ≤ UCL?**
If no, notes: None

☐ **Yes** ☑ **No** ☐ **NA Were any laboratory duplicates reported for project samples?**
If yes, notes: None

☐ **Yes** ☑ **No** ☐ **NA Were any matrix spike or matrix spike duplicates (MS/MSD) reported for project samples?**
If yes, notes: None

☑ **Yes** ☐ **No** ☐ **NA Were any laboratory control samples (LCS) or Blank Spikes reported?**
If yes, notes: No issues to report

☐ **Yes** ☑ **No** ☐ **NA Were calibration standards reported (ICV, CCV, Internal Standards)?**
If yes, notes: None

4. COMMENTS & SUMMARY OF ACTIONS TAKEN (Attach additional pages if necessary)

Comment 1: All samples on COC (12) upon receipt were placed on hold until further notice. In email correspondence, BC requested that sample S-3 (6-12) be analyzed.

No qualifications were required.

C. Woodlee
Signature of Data Validator(s)

Reviewer Initials LGP

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

June 05, 2020

Brown & Caldwell - Phoenix, AZ

Sample Delivery Group:	L1225459
Samples Received:	05/28/2020
Project Number:	154686
Description:	HVF West
Site:	HVF WEST
Report To:	Matthew Frailey 2 North Central Ave Suite 1600 Phoenix, AZ 85004

Entire Report Reviewed By: Daphne R Richards

Daphne Richards
Project Manager

TABLE OF CONTENTS

S-3 (6-12) L1225459-01 Solid

Collected by: Harrison Schultz
Collected date/time: 05/26/20 10:10
Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010D	WG1487443	5	06/04/20 20:26	06/05/20 09:43	TRB	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Daphne R Richards

Daphne Richards
Project Manager

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Lead	668		1.25	2.50	5	06/05/2020 09:43	WG1487443

Method Blank (MB)

(MB) R3535374-1 06/05/20 05:57

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Lead	U		0.250	0.500

Laboratory Control Sample (LCS)

(LCS) R3535374-2 06/05/20 05:59

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Lead	100	96.3	96.3	80.0-120	

L1225470-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1225470-09 06/05/20 06:02 • (MS) R3535374-5 06/05/20 06:09 • (MSD) R3535374-6 06/05/20 06:12

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Lead	100	1.56	96.9	93.9	95.3	92.3	1	75.0-125			3.15	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
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Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

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State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

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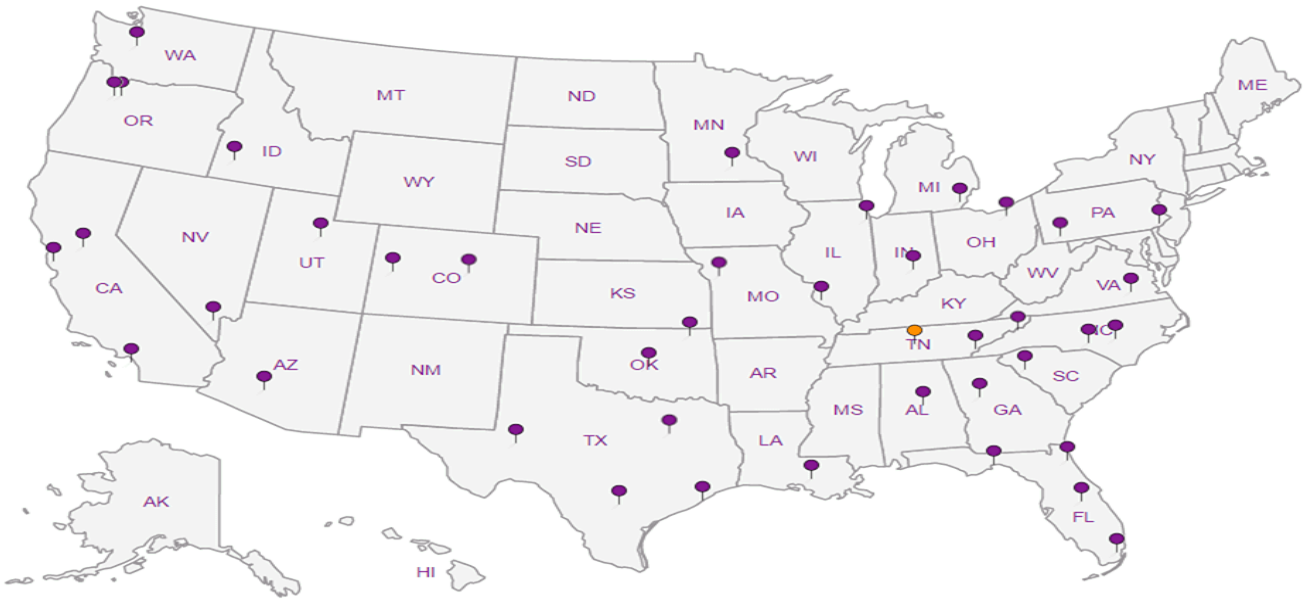

Chain of Custody Page 1 of 2

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Brown & Caldwell
2 North Central Avenue
Suite 1600
Phoenix, Arizona 85004

Billing Information:

Pres Chk

Report to: **Matthew Frailey**

Email To: **mfrailey@BrwnCald.com**

Project Description: **HVF West**

City/State Collected: Tucson, AZ

Phone: **602-567-3844**
Fax:

Client Project #: 154686

Lab Project #:

Collected by (print): Harrison Schultz

Site/Facility ID #: HVF West

P.O. #:

Collected by (signature): Harrison Schultz

Immediately Packed on Ice N___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #: 77143

Date Results Needed: HOLD

L#: L1225459

G122

Acctnum: **BROCAPAZ**
Template:
Prelogin:
TSR:
PB:
Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Hexavalent Chromium 3060A/7196A	Total Metals (Cd, Cr, Pb, Hg) 6010C/7471	Remarks	Sample # (lab only)
S-1 (6-12)	Comp	SS	6-12"	5-26-20	0945	2	X	X		
S-3 (6-12)	↓	↓	↓	↓	1010	↓	↓	↓		-01
S-4 (6-12)	↓	↓	↓	↓	0910	↓	↓	↓		
S-5 (6-12)	↓	↓	↓	↓	1035	↓	↓	↓		
S-6 (6-12)	↓	↓	↓	↓	1025	↓	↓	↓		
S-7 (6-12)	↓	↓	↓	↓	0855	↓	↓	↓		
S-8 (6-12)	↓	↓	↓	↓	1125	↓	↓	↓		
S-9 (6-12)	↓	↓	↓	↓	1115	↓	↓	↓		
S-10 (6-12)	↓	↓	↓	↓	0840	↓	↓	↓		
S-11 (6-12)	↓	↓	↓	↓	0920	↓	↓	↓		

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks: Hold All Samples

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier __ ______

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

RAD SCREEN: <0.5 mR/hr

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Matt Frailey	5/27/20	1545	[signature]
[signature]	5/27/20	1800	[signature]
			Received for lab by: (Signature) [signature]

Trip Blank Received: Yes / (No)
HCL / MeoH
TBR

Temp: AZ °C .7-1=.6
Bottles Received: 24

Date: 05/28/20 Time: 0800

If preservation required by Login: Date/Time

05-0231

Condition: NCF / (OK)

BNRAZ

Brown & Caldwell
2 North Central Avenue
Suite 1600
Phoenix, Arizona 85004

Billing Information:

Pres Chk

Report to: **Matthew Frailey**

Email To: **mfrailey@BrwnCald.com**

Project Description: **HVF West**

City/State Collected: Tucson, AZ

Phone: **602-567-3844**
Fax:

Client Project # 154686

Lab Project #

Collected by (print): Harrison Schultz

Site/Facility ID # HVF West

P.O. #

Collected by (signature): Harrison Schultz

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote # 77143

Date Results Needed HOLD

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Hexavalent Chromium 3060A/7196A	Total Metals (Cd, Cr, Pb, Hg) 6010C/7471
S-12 (6-12)	Comp	SS	6-12"	5-26-20	0927	2	X	X
DUP-2	Comp	SS	6-12"	5-26-20	1200	2	X	X

Chain of Custody Page 2 of 2

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
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Phone: 800-767-5859
Fax: 615-758-5859

L # L1225459

Table #

Acctnum: **BROCAPAZ**

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Remarks | Sample # (lab only)

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: Hold All Samples

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD SCREEN: <0.5 mR/hr

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Matt Frailey	5/27/20	1545	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	5/27/20	1800	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 1.7, 1.6 °C Bottles Received: 24

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Date: 05/28/20 Time: 0800

ENDAT

Andy Vann

From: Daphne Richards
Sent: Thursday, June 4, 2020 3:51 PM
To: Project Service
Cc: Jeremy Gupton
Subject: Taking sample off HOLD RUSH BROCAPAZ R2

Importance: High

HOLD 05-0231

Please log sample id S-3 (6-12) for PBICP.
Client is requesting R2 due 6/5

Thanks

Daphne Richards
Project Manager II
Pace Analytical - National
12065 Lebanon Road | Mt. Juliet, TN 37122
o.615.773.9662 | pacenational.com

Pace Analytical®

Brown AND Caldwell : LABORATORY DATA VERIFICATION AND VALIDATION FORM

1. PROJECT INFORMATION

Date: 6/24/20

Project Number: 154686 **Project Name/Client:** Fritz Enterprises, Inc.

Project Manager: Matthew Frailey **Sampled by:** H. Schultz

Laboratory: Pace Analytical **Report No.:** L1227071

2. SAMPLE INFORMATION

Purpose of sampling: Soil Sampling - SPLP Extraction **Sample Date:** 5/26/20

Total number of samples: 2

☐ Groundwater		☑ Soil	2	☐ Soil Gas		☐ Trip Blank	
☐ Surface water		☐ Sediment		☐ Other		☐ Field Blank	
☐ Drinking water		☐ Air		☐ Other		☐ Equip Blank	

Analyses requested: Total Metals - Cr,Pb (6010D/SPLP Extraction 1312)

Laboratory limits requested (MDLS, PQL, RL, etc.): RDL, MDL

Duplicates: None

3. DATA VERIFICATION

Check Yes/No/NA. Refer to applicable Data Verification Guidelines to determine appropriate action.

☑ Yes ☐ No ☐ NA **Was the Chain of Custody intact?**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Were custody seals intact on samples bottles and/or coolers as necessary?**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Were cooler temperatures within the acceptable range?**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Were samples physically and chemically preserved properly? (no headspace in VOC vials, proper pH, etc.)**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Does the case narrative appropriately address all quality issues and discrepancies?**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Were all samples labeled, analyzed, and reported correctly? (no samples held, no wrong analyses, etc.)**
If no, call lab immediately to verify. Notes: Comment 1

☑ Yes ☐ No ☐ NA **Were all samples analyzed within holding time?**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Were appropriate analytes reported?**
If no, notes: No issues to report

☑ Yes ☐ No ☐ NA **Were soil and/or sediment concentrations reported appropriately? (DW vs WW)**
If no, call lab immediately to verify. Notes: Leachate reported correctly

☐ Yes ☐ No ☑ NA **If analyzed for the following parameters, was the following true for all analytes?**

- ☐ Yes ☐ No ☑ NA Total metals ≥ Dissolved metals
- ☐ Yes ☐ No ☑ NA TKN > Organic nitrogen
- ☐ Yes ☐ No ☑ NA TKN > Ammonia (NH_3)
- ☐ Yes ☐ No ☑ NA COD > TOC
- ☐ Yes ☐ No ☑ NA COD > BOD

If no: Report to project manager and contact lab's QA/QC manager if needed. Notes: None

☑ Yes ☐ No ☐ NA **Were method detection limits (MDL), reporting limits (RLs), and/or dilution factors appropriate?**
If no: Report to project manager and contact lab if needed. Notes: No issues to report

☑ Yes ☐ No ☐ NA **Were any target analytes detected below practical quantitation limits (PQL) or reporting limits (RL)?**
If yes, notes: Lab qualifier, E4, indicates results below the PQL and results are considered estimated, J

☐ Yes ☑ No ☐ NA **Were target analytes detected in any equipment, field, trip, and/or laboratory method blanks?**
If yes, notes: No issues to report

☐ **Yes** ☑ **No** ☐ **NA Were any sample duplicates collected?**
If no, notes: None

☐ **Yes** ☐ **No** ☑ **NA Were surrogate % recoveries within the acceptable range of LCL ≤ x ≤ UCL?**
If no, notes: None

☐ **Yes** ☑ **No** ☐ **NA Were any laboratory duplicates reported for project samples?**
If yes, notes: None

☐ **Yes** ☑ **No** ☐ **NA Were any matrix spike or matrix spike duplicates (MS/MSD) reported for project samples?**
If yes, notes: None

☑ **Yes** ☐ **No** ☐ **NA Were any laboratory control samples (LCS) or Blank Spikes reported?**
If yes, notes: No issues to report

☐ **Yes** ☑ **No** ☐ **NA Were calibration standards reported (ICV, CCV, Internal Standards)?**
If yes, notes: None

4. COMMENTS & SUMMARY OF ACTIONS TAKEN (Attach additional pages if necessary)

Comment 1: All samples on COC (12) upon receipt were placed on hold until further notice. In email correspondence, BC requested that samples S-8 (0-6) and S-12 (0-6) be analyzed.

No qualifications were required.

C. Woodlee
Signature of Data Validator(s)

Reviewer Initials _____

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

June 12, 2020

Brown & Caldwell - Phoenix, AZ

Sample Delivery Group:	L1227071
Samples Received:	05/28/2020
Project Number:	154686
Description:	HVF West

Report To: Matthew Frailey
2 North Central Ave Suite 1600
Phoenix, AZ 85004

Entire Report Reviewed By: Daphne R Richards

Daphne Richards
Project Manager

TABLE OF CONTENTS

S-8-(0-6) L1227071-01 GW

Collected by: Harrison Schultz
Collected date/time: 05/26/20 11:25
Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1312	WG1490222	1	06/11/20 06:23	06/11/20 06:23	JWS	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1491754	1	06/12/20 15:26	06/12/20 16:18	TRB	Mt. Juliet, TN

S-12-(0-6) L1227071-02 GW

Collected by: Harrison Schultz
Collected date/time: 05/26/20 09:27
Received date/time: 05/28/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1312	WG1490222	1	06/11/20 06:23	06/11/20 06:23	JWS	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1491754	1	06/12/20 15:26	06/12/20 16:21	TRB	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Daphne R Richards

Daphne Richards
Project Manager

Preparation by Method 1312

Analyte	Result	Qualifier	Prep date / time	Batch
SPLP Extraction	-		6/11/2020 6:23:15 AM	WG1490222
Fluid	2		6/11/2020 6:23:15 AM	WG1490222
Final pH	10.17		6/11/2020 6:23:15 AM	WG1490222

Metals (ICP) by Method 6010D

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chromium	22.6		5.00	10.0	1	06/12/2020 16:18	WG1491754

Preparation by Method 1312

Analyte	Result	Qualifier	Prep date / time	Batch
SPLP Extraction	-		6/11/2020 6:23:15 AM	WG1490222
Fluid	2		6/11/2020 6:23:15 AM	WG1490222
Final pH	8.52		6/11/2020 6:23:15 AM	WG1490222

Metals (ICP) by Method 6010D

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Cadmium	1.95	E4	0.563	2.00	1	06/12/2020 16:21	WG1491754
Lead	U		2.95	6.00	1	06/12/2020 16:21	WG1491754

Method Blank (MB)

(MB) R3538137-1 06/12/20 15:56

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Cadmium	U		0.563	2.00
Chromium	U		5.00	10.0
Lead	U		2.95	6.00

Laboratory Control Sample (LCS)

(LCS) R3538137-2 06/12/20 15:58

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Cadmium	1000	934	93.4	80.0-120	
Chromium	1000	914	91.4	80.0-120	
Lead	1000	937	93.7	80.0-120	

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E4	Concentration estimated. Analyte was detected below laboratory minimum reporting level (MRL) but above MDL.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

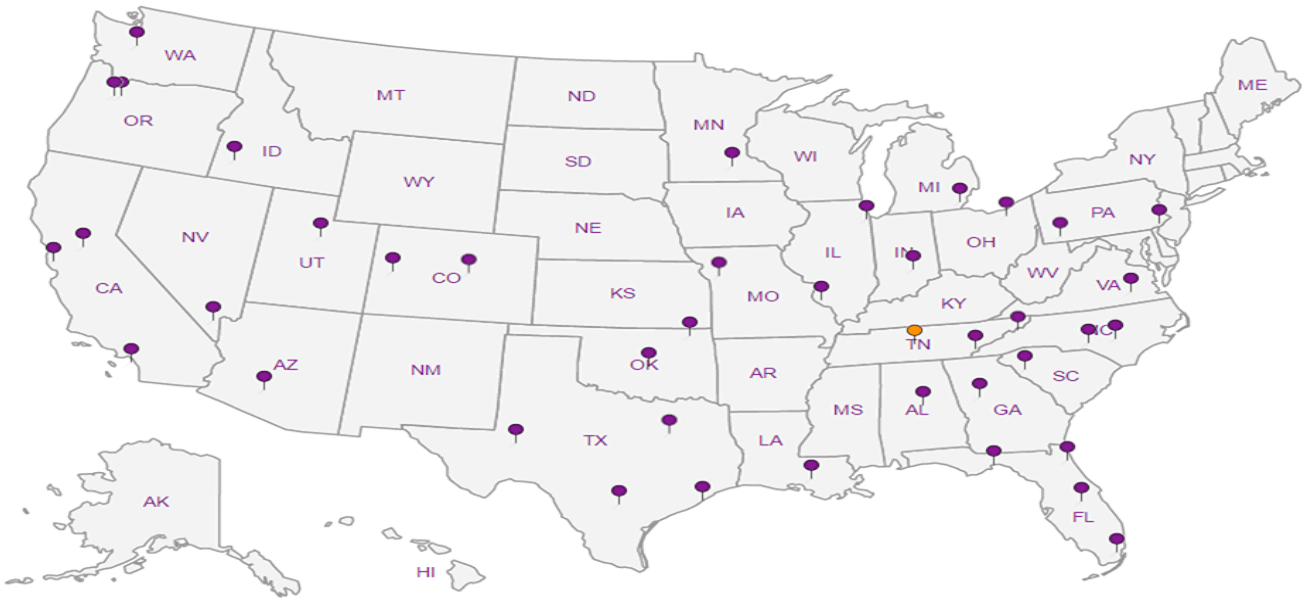
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Brown & Caldwell
2 North Central Avenue
Suite 1600
Phoenix, Arizona 85004

Billing Information:

Pres Chk

Chain of Custody Page 1 of 1

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
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Report to: **Matthew Frailey**

Email To: **mfrailey@BrwnCald.com**

Project Description: **HVF West**

City/State Collected: Tucson, AZ

Phone: **602-567-3844**
Fax:

Client Project # 154686

Lab Project #

L# 1227071

Collected by (print): Harrison Schultz

Site/Facility ID # HVF West

P.O. #

Collected by (signature): Harrison Schultz

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote # 77143

Date Results Needed: Normal TAT

Immediately Packed on Ice N ___ Y ✓

Template:
Prelogin:
TSR:
PB:
Shipped Via:

Analysis / Container / Preservative: Hexavalent Chromium 3060A/7196A; Total Metals (Cd, Cr, Pb, Hg) 6010C/7471

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Hexavalent Chromium 3060A/7196A	Total Metals (Cd, Cr, Pb, Hg) 6010C/7471	Remarks	Sample # (lab only)
S-1 S-1-(0-6)	Comp	SS	0-6"	5-26-20	0945	2	X	X		-01
S-3 S-3-(0-6)	↓	↓	↓	↓	1010	2	↓	↓		02
S-4 S-4-(0-6)					0910	2				03
S-5 S-5-(0-6)					1035	2				04
S-6 S-6-(0-6)					1025	2				05
S-7 S-7-(0-6)					0855	2				06
S-8 S-8-(0-6)					1125	2				07
S-9 S-9-(0-6)					1115	2				08
S-10 S-10-(0-6)					0840	2				09
S-11 S-11-(0-6)					0920	2				10

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_______

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ______

Tracking # SWA

Sample Receipt Checklist
COC Seal Present/Intact: _NP _Y _N
COC Signed/Accurate: _Y _N
Bottles arrive intact: _Y _N
Correct bottles used: _Y _N
Sufficient volume sent: _Y _N
If Applicable
VOA Zero Headspace: _Y _N
Preservation Correct/Checked: _Y _N
RAD SCREEN: <0.5 mR/hr

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)		
Matt Frailey	5/27/20	1545	[signature]	Trip Blank Received: Yes / No HCL / MeoH TBR	
[signature]	5/27/20	1800	[signature]	Temp: AT °C 1.5-2=1.3	Bottles Received: 28
			Received for lab by: (Signature) L. Webster	Date: 5/28/20	Time: 08:00

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

P NPAZ

Brown & Caldwell
2 North Central Avenue
Suite 1600
Phoenix, Arizona 85004

Billing Information:

Pres Chk

Report to: **Matthew Frailey**

Email To: **mfrailey@BrwnCald.com**

Project Description: **HVF West**

City/State Collected: Tucson, AZ

Phone: **602-567-3844**
Fax:

Client Project # 154686

Lab Project #

Collected by (print): Harrison Schultz

Site/Facility ID # HVF West

P.O. #

Collected by (signature): Harrison Schultz

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote # 77143

Date Results Needed: Normal TAT

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Hexavalent Chromium 3060A/7196A	Total Metals (Cd, Cr, Pb, Hg) 6010C/7471	Remarks	Sample # (lab only)
S-12 (0-6)	Comp	SS	0-6"	5-26-20	0927	2	X	X	-02	-11
S-1-MS	↓	↓	↓	↓	0945	↓	↓	↓		-01
S-1-MSD	↓	↓	↓	↓	0945	↓	↓	↓		-01
DUP-1	↓	↓	↓	↓	1200	2	X	X		-12
Equip Blank	Comp	DW (DI-W)	NA	5/26/20	1400	1	X	X		

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # L1227071

Table # L1227071

Acctnum: BROCAPAZ

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Analysis / Container / Preservative

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: OK to run hex chrome eq. blank 00H

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking # SWA

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
PAD SCREEN: <0.5 mR/hr

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Matthew Frailey	5/27/20	1545			
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.7 °C Bottles Received: 4.5-2=1.3 29	
	5/27/20	1800	SWA		
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 5/28/20 Time: 08:00	Hold: Condition: NCF / OK
			L. White		

DNRAD

L1227071

Katie Ingram

From: Daphne Richards <DRichards@pacenational.com>
Sent: Tuesday, June 9, 2020 4:27 PM
To: Project Service <ProjServ@pacenational.com>
Cc: Jeremy Gupton <JGupton@pacenational.com>; Heidi Ferrell <hferrell@pacenational.com>
Subject: Relog L1222632 BROCPAZ Rush
Importance: High

Please relog L1222632-11 for SPLP Cd and SPLP Pb
Relog L1222632-07 for SPLP Cr

Client is requesting two day tat due 6/11

Thanks

Daphne Richards
Project Manager II
Pace Analytical - National
12065 Lebanon Road | Mt. Juliet, TN 37122
o.615.773.9662 | pacenational.com

Pace Analytical®

Brown AND Caldwell : LABORATORY DATA VERIFICATION AND VALIDATION FORM

1. PROJECT INFORMATION

Date: 6/24/20

Project Number: 154686 **Project Name/Client:** Fritz Enterprises, Inc.

Project Manager: Matthew Frailey **Sampled by:** H. Schultz

Laboratory: Pace Analytical **Report No.:** L1229769

2. SAMPLE INFORMATION

Purpose of sampling: Soil Sampling **Sample Date:** 6/16/20

Total number of samples: 2

☐ Groundwater		☑ Soil	2	☐ Soil Gas		☐ Trip Blank	
☐ Surface water		☐ Sediment		☐ Other		☐ Field Blank	
☐ Drinking water		☐ Air		☐ Other		☐ Equip Blank	

Analyses requested: Total Metals - Pb (6010D)

Laboratory limits requested (MDLS, PQL, RL, etc.): RDL, MDL

Duplicates: None

3. DATA VERIFICATION

Check Yes/No/NA. Refer to applicable Data Verification Guidelines to determine appropriate action.

☑ **Yes** ☐ **No** ☐ **NA Was the Chain of Custody intact?**
If no, notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Were custody seals intact on samples bottles and/or coolers as necessary?**
If no, notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Were cooler temperatures within the acceptable range?**
If no, notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Were samples physically and chemically preserved properly? (no headspace in VOC vials, proper pH, etc.)**
If no, notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Does the case narrative appropriately address all quality issues and discrepancies?**
If no, notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Were all samples labeled, analyzed, and reported correctly? (no samples held, no wrong analyses, etc.)**
If no, call lab immediately to verify. Notes: Comment 1

☑ **Yes** ☐ **No** ☐ **NA Were all samples analyzed within holding time?**
If no, notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Were appropriate analytes reported?**
If no, notes: No issues to report

☑ **Yes** ☐ **No** ☐ **NA Were soil and/or sediment concentrations reported appropriately? (DW vs WW)**
If no, call lab immediately to verify. Notes: Wet basis

☐ **Yes** ☐ **No** ☑ **NA If analyzed for the following parameters, was the following true for all analytes?**

- ☐ Yes ☐ No ☑ NA Total metals ≥ Dissolved metals
- ☐ Yes ☐ No ☑ NA TKN > Organic nitrogen
- ☐ Yes ☐ No ☑ NA TKN > Ammonia (NH_3)
- ☐ Yes ☐ No ☑ NA COD > TOC
- ☐ Yes ☐ No ☑ NA COD > BOD

If no: Report to project manager and contact lab's QA/QC manager if needed. Notes: None

☑ **Yes** ☐ **No** ☐ **NA Were method detection limits (MDL), reporting limits (RLs), and/or dilution factors appropriate?**
If no: Report to project manager and contact lab if needed. Notes: No issues to report

☐ **Yes** ☑ **No** ☐ **NA Were any target analytes detected below practical quantitation limits (PQL) or reporting limits (RL)?**
If yes, notes: No issues to report

☐ **Yes** ☑ **No** ☐ **NA Were target analytes detected in any equipment, field, trip, and/or laboratory method blanks?**
If yes, notes: No issues to report

Initials CRW

☐ Yes ☑ No ☐ NA **Were any sample duplicates collected?**
If no, notes: None

☐ Yes ☐ No ☑ NA **Were surrogate % recoveries within the acceptable range of LCL ≤ x ≤ UCL?**
If no, notes: None

☐ Yes ☑ No ☐ NA **Were any laboratory duplicates reported for project samples?**
If yes, notes: None

☐ Yes ☑ No ☐ NA **Were any matrix spike or matrix spike duplicates (MS/MSD) reported for project samples?**
If yes, notes: None

☑ Yes ☐ No ☐ NA **Were any laboratory control samples (LCS) or Blank Spikes reported?**
If yes, notes: No issues to report

☐ Yes ☑ No ☐ NA **Were calibration standards reported (ICV, CCV, Internal Standards)?**
If yes, notes: None

4. **COMMENTS & SUMMARY OF ACTIONS TAKEN (Attach additional pages if necessary)**

Comment 1: Samples S-15 (0-6) and S-16 (0-6) were held pending further notice.

No qualifications were required.

C. Woodlee
Signature of Data Validator(s)

Reviewer Initials LGP

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

June 18, 2020

Brown & Caldwell - Phoenix, AZ

Sample Delivery Group:	L1229769
Samples Received:	06/17/2020
Project Number:	154686
Description:	HVF West
Site:	HVF WEST
Report To:	Matthew Frailey 2 North Central Ave Suite 1600 Phoenix, AZ 85004

Entire Report Reviewed By: Daphne R Richards

Daphne Richards
Project Manager

TABLE OF CONTENTS

S-13 (0-6) L1229769-01 Solid

Collected by: Harrison Schultz
Collected date/time: 06/16/20 09:40
Received date/time: 06/17/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010D	WG1494180	10	06/17/20 18:47	06/18/20 12:18	TRB	Mt. Juliet, TN

S-14 (0-6) L1229769-02 Solid

Collected by: Harrison Schultz
Collected date/time: 06/16/20 10:00
Received date/time: 06/17/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010D	WG1494180	10	06/17/20 18:47	06/18/20 12:20	TRB	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Daphne R Richards

Daphne Richards
Project Manager

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Lead	597		2.08	5.00	10	06/18/2020 12:18	WG1494180

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Lead	535		2.08	5.00	10	06/18/2020 12:20	WG1494180

Method Blank (MB)

(MB) R3539930-1 06/18/20 01:50

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Lead	U		0.208	0.500

Laboratory Control Sample (LCS)

(LCS) R3539930-2 06/18/20 01:53

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Lead	100	96.9	96.9	80.0-120	

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

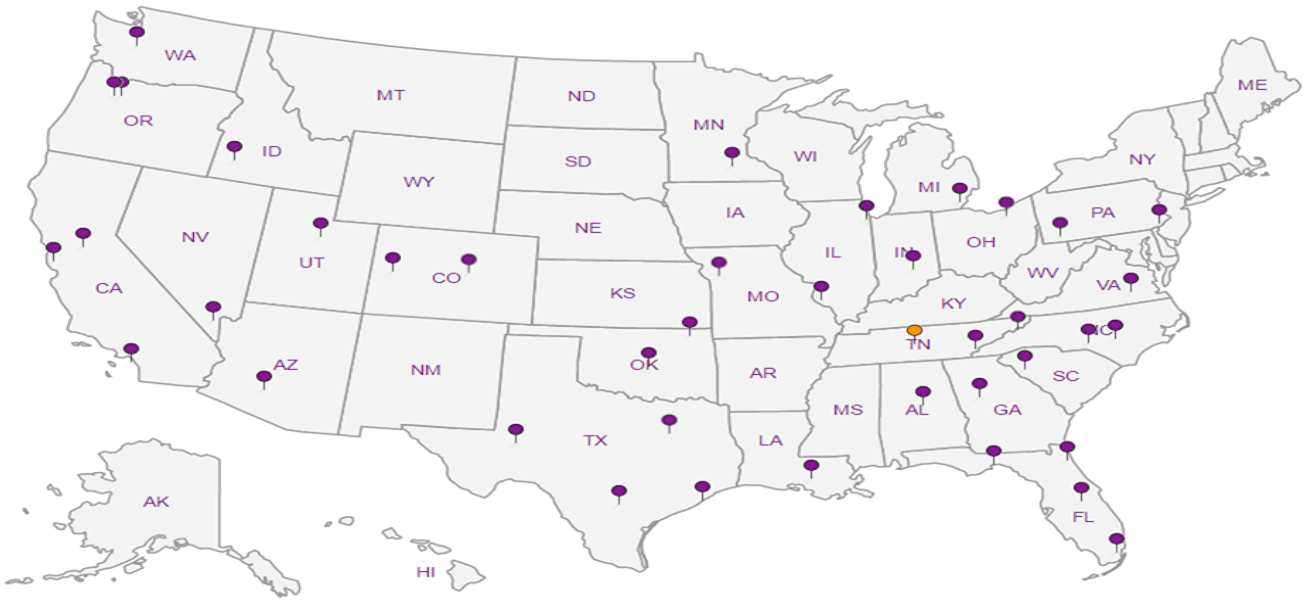
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Brown & Caldwell
2 North Central Avenue
Suite 1600
Phoenix, Arizona 85004

Billing Information:

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Report to: **Matthew Frailey**

Email To: **mfrailey@BrwnCald.com**

Project Description: **HVF West**

City/State Collected: Tucson, AZ

Phone: **602-567-3844**
Fax:

Client Project # 154686

Lab Project #

L# 4229769
D153

Collected by (print): Harrison Schultz

Site/Facility ID # HVF West

P.O. #

Collected by (signature): Harrison Schultz

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
X Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Acctnum: **BROCAPAZ**
Template:
Prelogin:
TSR:
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Lead by 6010	Remarks	Sample # (lab only)
S-13 (0-6)	Comp	SS	0-6	6-16-20	0940	1	X	~~HOLD~~ CW	-01
S-15 (0-6)	Comp	↓	↓	↓	0950	1	X HOLD	HOLD	
S-16 (0-6)	Comp				1010	1	X HOLD	HOLD	
S-14 (0-6)	Comp	↓	↓	↓	1000	1	X		-02

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD SCREEN: <0.5 mR/hr

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Harrison Schultz	6-16-20	14:46	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	6/16/20	1800	SWA
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / (No)
HCL / MeoH
TBR

Temp: DNPA2 °C 8+1=.9 Bottles Received: 4

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Date: 6-17-20 Time: 0800

DNPA2

Appendix B: Data Usability Report

DATA QUALITY ASSESSMENT and
DATA USABILITY EVALUATION

SDG Nos.: L1222632, L1225459, L1227071, L1229769

Laboratories: Pace Analytical, Mount Juliet, TN

Site: HVF West LLC

Reviewer: Catherine Woodlee **Date:** June 24, 2020

A Data Quality Assessment was performed on analytical data from soil samples and one (1) equipment blank. A Data Usability Evaluation was also conducted and follows the Data Quality Assessment. The following table outlines the analytical methods used to analyze the samples:

Analysis	Method
Total Metals - cadmium, chromium, lead, and mercury	6010D/7174B
Hexavalent chromium	3060A/7196A
Total Metals – chromium and lead	6010D/SPLP Extraction

This review was based on guidance provided by Guidance on Environmental Data Verification and Data Validation, EPA QA/G-8 (2002). The data quality assessment included the following parameters:

- Report Completeness
- Sample Temperatures/Preservation/Holding Times
- Laboratory and Field Blanks
- MS/MSD Results
- Field/Laboratory Duplicate precision
- Laboratory Control Sample (LCS) Recoveries
- Reporting Limits
- Reported nonconformances

DATA QUALITY ASSESSMENT

Report Completeness

The laboratory report included all data required by the technical guidance.

Sample Temperature/Preservation/Holding Times

Samples were received at an acceptable temperature range of 0.6 to 1.3 °C.
Samples were properly preserved except for the pH of the Equipment Blank. The sample pH was adjusted, and analysis proceeded.
Holding times were met for each analysis except for the 24-hour hold time for hexavalent chromium in the Equipment Blank. Sample results were qualified as estimated, J.

Laboratory and Field Blanks

Each of the laboratory and field blanks reported no detections of the constituents analyzed.

MS/MSD Results

The matrix spike (MS) and MS duplicate (MSD) recoveries and relative percent differences were outside control limits for mercury, cadmium, chromium, and lead in sample S-1-(0-6). Parent sample detections were qualified as estimated, J.

Field/Laboratory Duplicate Precision

Sample Dup-1 is a field duplicate of sample S-11-(0-6). Duplicate precision between the Field Duplicate and the parent sample were within control limits. A laboratory replicate was analyzed and precision was within control limits.

Laboratory Control Sample (LCS) Recoveries

Each of the LCS analysis recoveries was within control limits.

Reporting Limits

Requested reporting limits were achieved.

Reported Non-conformances

There were no reported non-conformances other than those listed above.

DATA USABILITY EVALUATION

The data quality assessment identified analytical variances that did not meet the data of known quality protocols and could potentially affect the data usability. The purpose of this section is to evaluate how these variances affect the usability of the data.

All data are usable with the following qualifications:

The matrix spike (MS) and MS duplicate (MSD) recoveries and relative percent differences were outside control limits for mercury, cadmium, chromium, and lead in sample S-1-(0-6). Parent sample detections were qualified as estimated, J due to likely high bias and poor precision.

No other issues were identified that did not meet the Data of Known Quality Protocols and all unqualified results can be considered data of known quality.

<u>Validation Qualifiers</u>

The following validation qualifiers may have been applied to the data, as appropriate.

- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ = The analyte was not detected above the sample reporting limit; and the reporting limit is approximate.
- U = The analyte was tested for but was not detected above the sample reporting limit.
- R = The sample result is rejected due to serious deficiencies. The presence or absence of the analyte cannot be verified.
- B = The analyte was also detected in one or more associated blanks. The result may be biased high and may not be indicative of Site contamination.

Appendix C: Example Signage

Public Notice of Remedial Action

"Site Name"

Brown and Caldwell (or sampling contractor) is conducting remediation activities, on behalf of HVF West Inc., to evaluate metals impacted soil resulting from previous operations. The project is being performed under the guidance of the Arizona Department of Environmental Quality Voluntary Remediation Program (VRP).

Anticipated duration of activities:

Month/Day/Year through Month/Day/Year

For information please contact

Brian
Stonebrink
Project Manager
ADEQ VRP
602-771-4197

OR

Contractor
Project Manager
Phone number

ADEQ Arizona Department of Environmental Quality

Company Logo